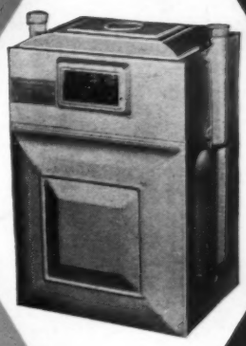
WESTERN GAS

DOMESTIC METERS *by* EMCO

IRONCLAD METERS



TIN METERS

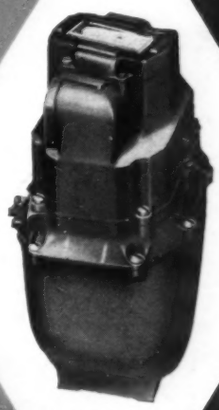
These are the meters you need if you are going to install equipment that will measure accurately, with a minimum maintenance, for years to come. In doing so, you build up your greatest asset—better public relations.

No one type of domestic meter is suitable for all conditions. That's why EMCO developed a complete line—Iron, Curb, Tin—embodying exclusive EMCO features. On new services install new meters—Buy EMCOs.

EMCO METERS

NORDSTROM METER COCKS

If you want positive shut-off, quick easy opening and closing Meter cocks—specify and install only lubricated NORDSTROMS.



CURB BOX METERS

PITTSBURGH EQUITABLE METER CO.
MERCO NORDSTROM VALVE CO.
MAIN OFFICES PITTSBURGH, PA.
ATLANTA BUFFALO CHICAGO MEMPHIS
NEW YORK COLUMBIA KANSAS CITY PHILADELPHIA TULSA HOUSTON LOS ANGELES OAKLAND

Above is shown a cast iron pipe installed 100 years ago in Boston's gas distribution system, and still in service. To add to cast iron pipe's long life would be superfluous so we have added to its efficiency by developing and perfecting a bottle-tight joint.

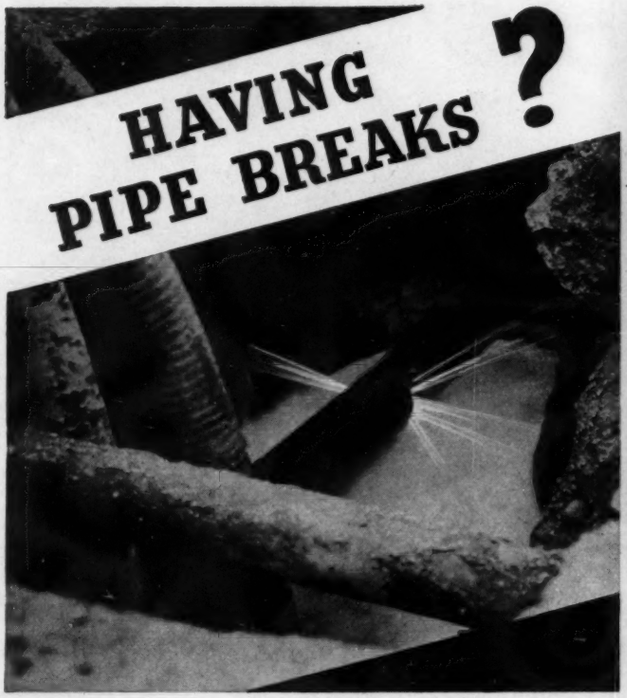
•

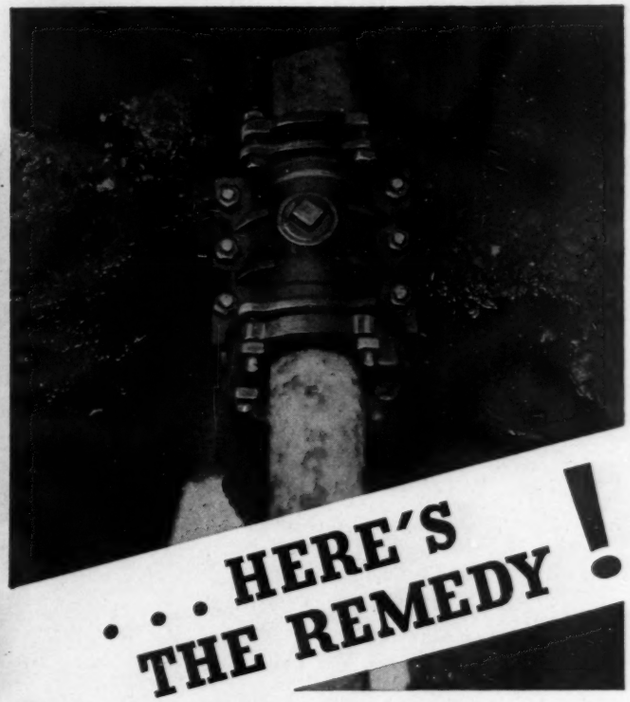
Stuffing-box type mecnanical joints for use with cast iron pipe, as developed by C. I. P. R. A. members, are bottle-tight under all working pressures; proved so in field-performance and by tests in the laboratory of the A. G. A.

CAST IRON PIPE

THE STANDARD MATERIAL FOR DISTRIBUTION MAINS

The Cast Iron Pipe Research Ass'n, Thos. F. Wolfe, Research Engineer, 1015 Peoples Gas Bldg., Chicago





Make the Repair QUICKLY! PERMANENTLY! —with DRESSER SPLIT SLEEVES

TOP — Dresser Cast Split Sleeve, Style 57. Sizes 2" to 12" inclusive. For packing off a section of cast-iron pipe 8" long.

CENTER—Multiple installations of Style 57 can be adapted for almost any length of break.

BOTTOM — Don't forget Dresser Cast Split Sleeves, Style 26 (sizes 3" to 24" inclusive) for enclosing broken bells.

Above is a picture of a water line, deliberately chosen to illustrate visually what frequently happens to a gas line. No need to let such a break cripple or interrupt your service. Ordinary workmen can make the repair easily, positively, and permanently—in a very *few minutes!* Just give them a Dresser Split Sleeve to enclose the break, and a wrench to tighten the bolts.

The Dresser *rubber pack* makes an instantly effective and lasting seal; it also provides the continuous flexibility needed at the point where the pipe failed. Put the Sleeve on and *leave* it on—for good!

You can avoid unnecessary service interruptions this winter—and the high cost of makeshift repairs—by using the Dresser method of repairing broken pipe and bells. Style 57 repairs cast-iron pipe; and Style 73 is for steel pipe. Write for Folder No. 57.

S. R. DRESSER MANUFACTURING CO. • BRADFORD, PA.

In Canada: Dresser Mfg. Company, Ltd., 32 Front St., W., Toronto, Ont.

KEEP A DRESSER SLEEVE ON HAND FOR QUICK REPAIRS

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WESTERN GAS

"Reg. U. S. Pat. Off."

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ANATOL FOMILYANT, News Editor W. G. RUSSELL, Field Representative

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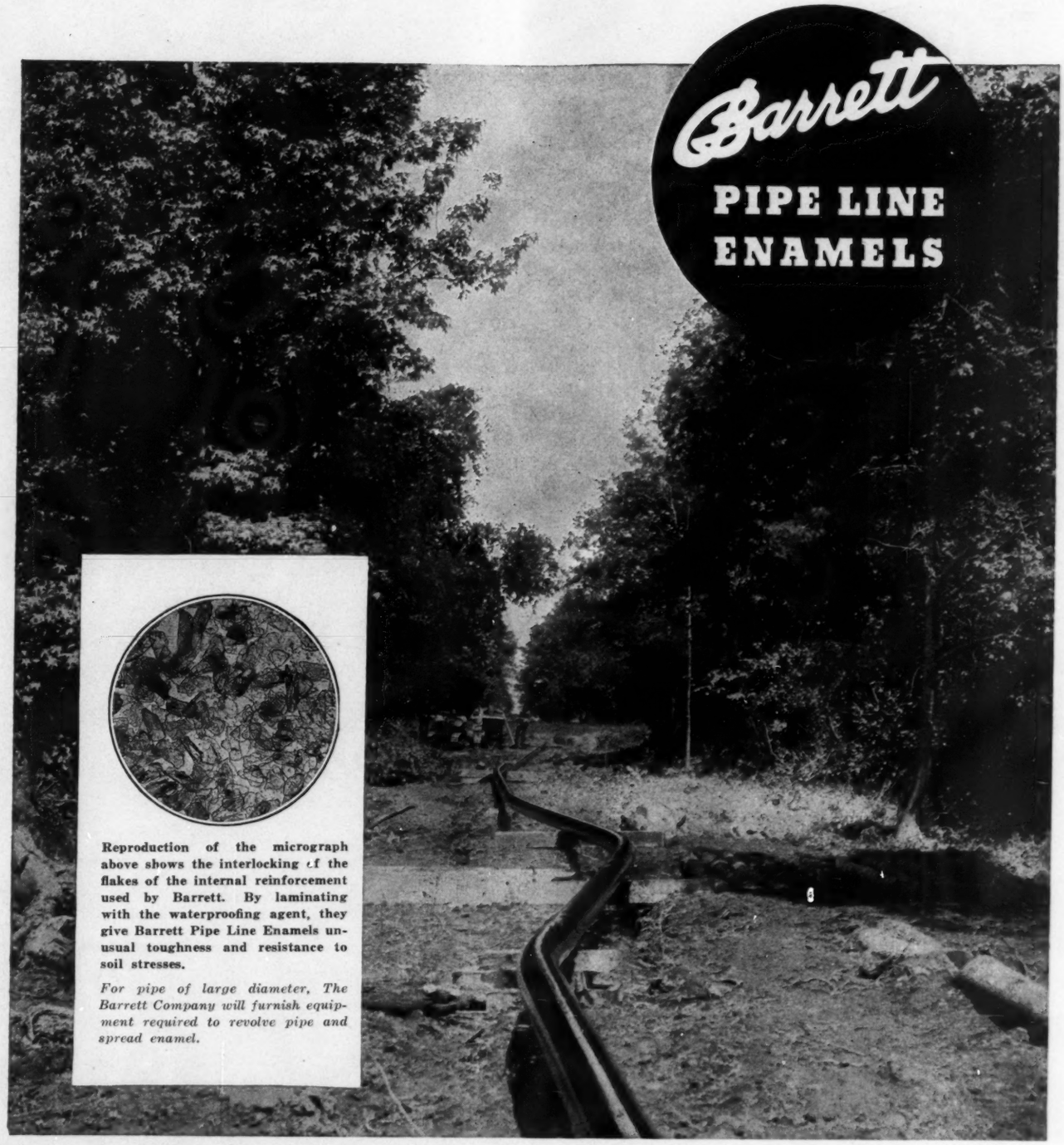


Reproduction of the micrograph above shows the interlocking of the flakes of the internal reinforcement used by Barrett. By laminating with the waterproofing agent, they give Barrett Pipe Line Enamels unusual toughness and resistance to soil stresses.

For pipe of large diameter, The Barrett Company will furnish equipment required to revolve pipe and spread enamel.

Courtesy United Gas System.

Solving the pipe line engineers' corrosion problem

FIELD SERVICE

Carefully trained Barrett field men will gladly work with you, combining their special knowledge and experience with your familiarity with conditions along the right of way.

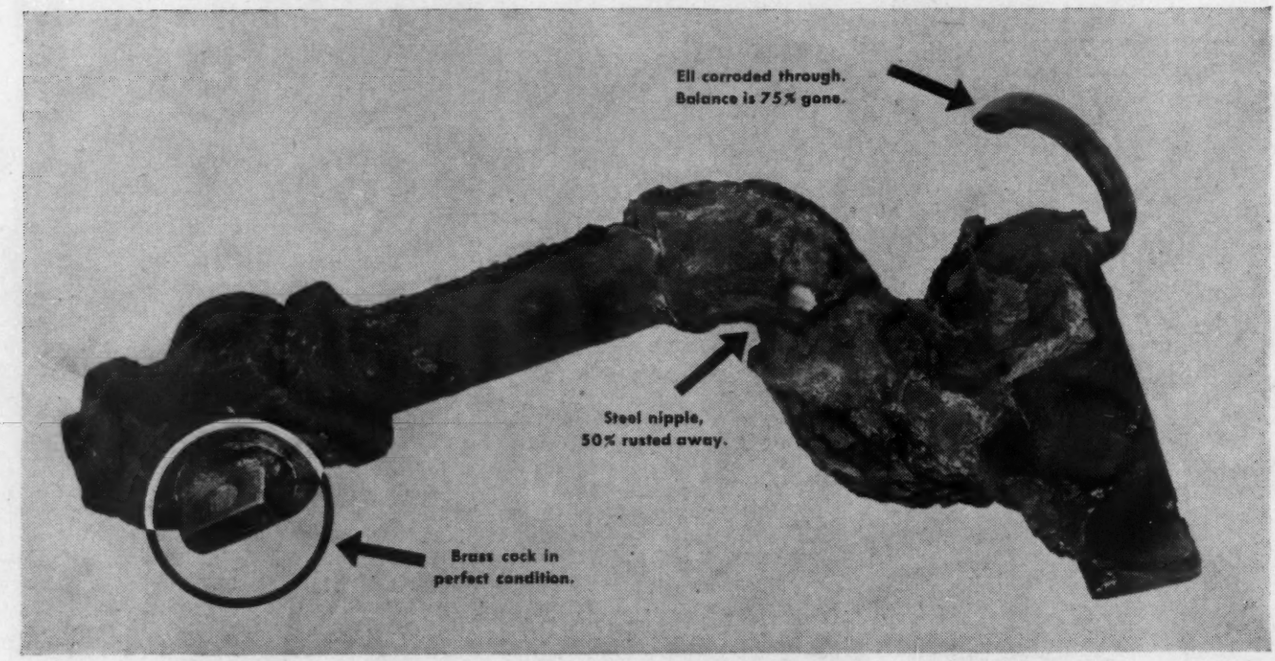
THE TECHNICAL SERVICE BUREAU of The Barrett Company invites your consultation with its technically trained staff, without cost or obligation. Address The Technical Service Bureau, The Barrett Company, 40 Rector Street, New York, N. Y.

Whatever the type of pipe . . . whether it is a new line or an old one that needs reconditioning . . . engineers may specify Barrett Pipe Line Enamels with complete assurance of maximum protection and lowest possible cost. Barrett's large-volume production of coal-tar pitch for all industries plus its unmatched 82 years of waterproofing experience insure uniformly satisfactory results—long lasting protection that effectively solves corrosion problems along any right of way. Wire or write for complete information.

THE BARRETT COMPANY, 40 RECTOR STREET, NEW YORK, N. Y.

Rusted to uselessness in less than five years

COPPER WOULD HAVE LASTED MANY TIMES LONGER



Note that this assembly is completely ruined by rust, save for the *brass* cock in the white circle at lower left.

IN A SECTION of Texas where the soil is unusually corrosive, several hundred rusted-out gas service connections were recently replaced with new copper tube services.

The above photograph shows part of one of these rusted-out services which lasted only from four to four-and-a-half years. *Copper would have lasted many times longer.* In fact, experience has indicated that, when used for small mains and services, the rate of corrosion on copper is only about one-tenth as rapid as on rustable metals.

The ultimate economy of a copper tube installation is clearly revealed by these two facts—

FIRST: the greater durability of copper substantially reduces the annual cost for material and maintenance, compensating in a few years for the slightly higher original cost of copper.

SECOND: the first repair job of any consequence to rustable lines costs far more than the original saving.

The American Brass Company recommends that all copper tubes installed underground be connected by means of flared tube fittings, or special fittings. If solder type fittings be employed, the joints should be brazed or welded rather than soft soldered. Underground lines are frequently subjected to considerable movement caused by constant shifting of the soil. The mechanical joint secured by the flared tube type of fitting is better adapted to such service than soldered connections.

ANACONDA
from mine to consumer
85614

THE AMERICAN BRASS COMPANY
General Offices: Waterbury, Connecticut
Offices and Agencies in Principal Cities

ANACONDA COPPER & BRASS

DAYTON NO. 1 COUPLINGS

Manufactured in three types with size range ½-in. to 24-in.

MANY improvements have been incorporated in the design and construction of the Dayton No. 1 Coupling in anticipation of future pipe line requirements.

THE NATIONAL SUPERIOR CO.
DAYTON PIPE COUPLING DIVISION DAYTON·OHIO

Service lines that help you *give REAL SERVICE*

THE clean, smooth interior surface of NATIONAL Scale Free Pipe is a big aid to gas companies who value their reputation for service and who scrutinize their piping costs.

There is no scale in this pipe to come loose and clog small orifices, your delicate meters or otherwise harm your service. The scale is removed mechanically by a special Scale Free Process, (butt weld sizes ½" to 3"). Other outstanding advantages are full delivery capacity, less friction loss, greater strength at the weld. Added corrosion resistance, particularly against pitting, is given by the Spellerized treatment.

When you order standard pipe for service lines, specify NATIONAL Scale Free Spellerized and be sure of the maximum in performance and economy. Large use by shrewd buyers, continued for many years, has made it America's Standard Wrought Pipe.

CHROMATE TREATMENT—ALL NATIONAL Galvanized Pipe is given a special chromate treatment to resist discoloration and the formation of white rust. This patented process preserves that smooth, glistening surface or metallic lustre which is characteristic of good galvanizing.

NATIONAL TUBE COMPANY - PITTSBURGH, PA.

Pacific Coast Distributors: Columbia Steel Co., San Francisco
Export Distributors: United States Steel Products Co., New York City

THE *Original* SCALE FREE PIPE
"It's Spellerized"

UNITED STATES STEEL

WESTERN GAS
MARCH, 1936

Guest Editorial

OPEN MINDS ON GAS

By GEO. E. WHITWELL
Vice-President in Charge of Sales, Philadelphia Electric Company

TO BE in a position to write with the background of a combination company, has certain advantages. Among other things it leads me to believe that the major problems confronting the gas industry today are human as opposed to technological. Human problems are ever so much harder to solve because they involve emotions, traditions, prejudices, psychology and traits of human nature too numerous to list.

It seems universally more difficult for human beings to cope with a human problem because, being what we are, we cannot easily remove ourselves and view a given situation with the coldly analytical approach that we make to technological problems. Human relationships frequently approach the workings of the well-known vicious circle.

As an industry, we in the gas business must break through preconceived ideas and view the present situation in its true perspective, even at the expense of casting aside some of our pet theories. We should retain only those things which we know to be applicable to the set of human conditions confronting us now.

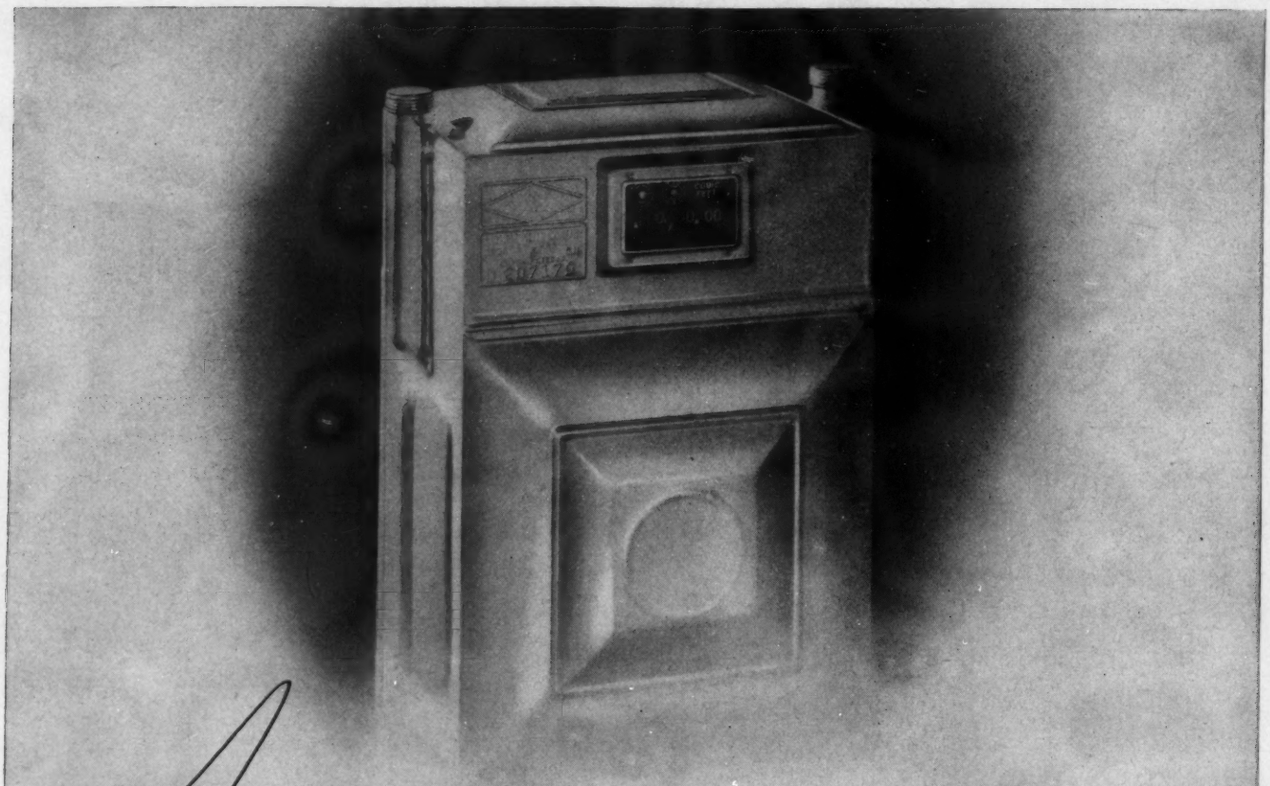
It seems to me that too much of our energy in the gas business is expended in protecting, sometimes against human and economic odds, that which we have; and too little in developing to the full those fields where gas as a fuel possesses enough inherent advantages to occupy a place where competition would be hard pressed to excel. Has the industry done the best it knows how individually and collectively to cultivate the markets where gas is supreme so that decreases in costs resulting from increased use will tend to intrench it even more firmly in all fields of application?

Years ago the industry faced a major problem in competing with the electric light, one of the constructive results of which is that today no one will deny that stubborn fighting against social, human and economic progress results only in damage to all parties. I do not mean that an aggressive policy is to be discouraged, but fighting to retain that which obstructs true human progress is a waste of time. The gas industry learned this to its great advantage when out of the loss of its lighting load came the immensely valuable cooking, water-heating, and refrigeration business which it enjoys today.

In the field of industry, I do not need to point out the almost limitless applications of gas as a clean, safe, convenient and uniform fuel capable of exact regulation. Similarly, the application of gas to solve the domestic house-heating problem offers a field wherein many potential customers of average means, who think they cannot afford this service, have not been sold. Other fuels attempting to offer comparable advantages have not neglected these individuals and have steadily and persistently held out inducements to persuade them to increase their heating budgets to obtain modern automatic equipment.

From the gas utility standpoint these two fields offer much hope. And they always have. Yet the gas industry remains with, in general, much and, in instances, most of its dependence for future growth and security placed in domestic cooking and water-heating.

Let us take stock and review our business and our potentialities from the viewpoint of the 1936 thinking of the human beings who are our customers. Let us protect ourselves from such business losses as that thinking may tend to bring—but not stubbornly or unintelligently. And let us really go after the great unsold markets.



Accuracy

". . . . it represents our base point of reference in considering meter performance. The meter stands as sole arbiter of the customer's and company's interests. Accurate equipment imposes a fair charge on the customer and yields a corresponding revenue to the company. In the event of a dispute, correct meter registration is a most effective agent in the hands of the company. The meter continuously resides on the customer's premises, and monthly it touches his pocketbook. In the fullest sense it is the outpost of public relations."

From "Factors and Trends in Meter Maintenance", a paper presented before the A. G. A. Distribution Conference at Cleveland, Ohio, May 2-4, 1935.

AMERICAN METER CO. MEASUREMENT ENGINEERS CENTENNIAL 1836-1936

AMERICAN METER COMPANY
INCORPORATED
Measurement and control of Gas, Oil, Steam, Air and Liquids
GENERAL OFFICES: 60 EAST 42nd STREET, NEW YORK, N.Y.

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March, 1936

WESTERN GAS

"Reg. U. S. Pat. Off."

Vol. XII, No. 3

LOS ANGELES—810 South Spring Street . . . . . 1064 Peoples Gas Building—CHICAGO

Our Primary Domestic Market

INFORMATION from the series of consumer studies being conducted by the Department of Commerce drives home the point that the gas industry's primary market is the buyer of modest income. In a typical community recently surveyed, something more than 86 per cent of the reporting families had incomes of less than $2,000. These families constituted 82 per cent of the users of central heating equipment; 85 per cent of the users of gas for cooking; more than half of the users of mechanical refrigerators.

These are the buyers at which our domestic sales campaigns should be slanted. And with today's financing services they can be sold quality appliances.

Headway on Water Heating Campaign

ENROLLMENTS in the first national automatic gas water heater sales campaign are pouring into contest headquarters at a gratifying rate. By late February 300 gas companies and 900 plumber-dealers were listed among participants, according to C. W. Berghorn, executive secretary of the Association of Gas Appliance and Equipment Manufacturers. A group of 21 members of the A.G.A.E.M. water heater division, sponsors for the contest, have raised $100,000 to underwrite this long-needed campaign, which is centering attention upon one of the industry's best load-builders. Water heating has gone modern, along with ranges and other domestic appliances. It deserves its share of sales effort, and will more than pay its way.

What Effects from T.V.A. Decision?

HOW far-reaching is the U. S. Supreme Court's decision in the T.V.A. case? Answers to this question vary as widely as the viewpoints of those submitting them.

Those in sympathy with the government's power aspirations are hailing the ruling in the Alabama Power Co. case as giving fundamental approval, at least by implication, to the whole socialized power program. Proposals for further federal excursions into the power distribution field may be expected to follow thick and fast. In fact, close on the heels of the decision came a recommendation from the National Resources Committee for a regional power development of vast proportions in the Columbia River Valley. Those urging a regimented development of the Mississippi River Valley along T.V.A. lines also took immediate encouragement from the decision. T.V.A., naturally, is now rushing its plans for supplying electricity to the additional communities which have voted to acquire local distribution systems and to use government power.

Meanwhile preferred stockholders of the Alabama Power Co., who brought the original action, late last month petitioned the Supreme Court to reconsider its decision sanctioning T.V.A.'s disposal of power from Wilson Dam. Many commentators hold that effect of the decision is confined to disposal of power from this one dam, through the specific contract dealt with in the proceeding.

If the decision is to be interpreted as applying fundamentally to disposal of surplus power, not only from Wilson Dam but also from every other dam which might be built by the government to "improve navigation," there is good reason to expect the present administration to push its power program ahead on every front. In that event the utilities' chief hope lies in the nation's ballot box.

It is regrettable that the decision could not have been laid down along broader lines, basically determining constitutionality of government power objectives in the Tennessee Valley and elsewhere. Underlying objectives of the power program were carefully excluded from the government's case, it is to be noted. Although the T.V.A. enterprise from the first has been proclaimed throughout the land as an inspired social betterment undertaking, the government chose to rest its case upon technical grounds—the constitutional right to improve navigable streams.

There are some grounds for hoping that the T.V.A. project may yet come before the court in a form which will lead to a definite answer on whether the government may create unlimited "surplus" power and sell it in competition with private industry.

A check-up of editorial opinion on the decision, made last month by the United States News, indicates that more than half of the newspapers commenting on the case believe it left major questions unsettled as regards government competition with private business.

No matter what may be the eventual status of government power activities, gas companies have one plain course to follow —sell gas by every modern means; clinch existing customers by replacing inferior or obsolete appliances; get domestic rates in line and build up the use of our product in every home.

★ ★

NEXT MONTH

Chain Store Taxes and Utility Appliance Sales Operations

In a few sections gas companies already have felt the effect of state chain store taxes; some merchandising activities have been discontinued as a result. How will utilities be affected if chain store tax measures are enacted in other states? An article arranged for April outlines some of the issues in this chain store tax matter.

Successful Load-Building Through the Distribution Department

In this feature is reviewed a four-month load-building and load-retaining effort which involved active work of 250 distribution department employees. Real results were secured, and the article gives the formula.

Corrosion Due to Dissimilar Metals in Distribution Systems

This subject is of growing interest in view of the trend toward use of copper in gas distribution systems. A current investigation will be reported next month.

BREAKFAST IN 6 MINUTES!

LAST month *Western Gas* published a brief comment on a cooking contest developed by Wm. E. Leverette, commercial manager of the Nashville Gas and Heating Co. This "Breakfast in 6 Minutes" idea is so far out of the ordinary, and so well calculated to establish the speed of gas as a cooking fuel, that we have persuaded Mr. Leverette to give us a more complete picture of his contest. Illustrations of advertising which went along with the event, published below, make it plain that there is a world of potential publicity for gas—and all of it good—wrapped up in the "Breakfast in 6 Minutes" plan.

The idea and theme for this contest came into being about as follows (we imagine the scene was laid in Nashville, in the home of Mr. Leverette, though his modesty leaves us in doubt on this point):

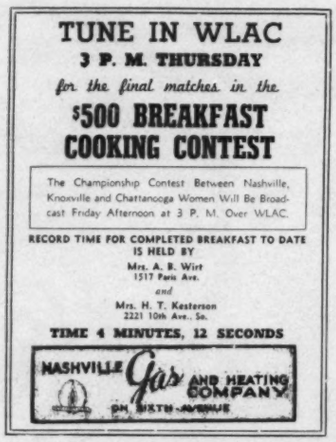
WM. E. LEVERETTE
Commercial Manager, Nashville Gas and Heating Co.

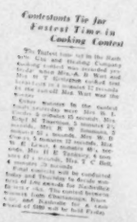
Coming down to breakfast rather late on a certain morning, one of the originators of this plan asked his colored cook how long it would take her to fix breakfast, and told her that he didn't have much time to spare. The answer was "'Bout 6 minutes." He promised her a present if the breakfast was on the table in 10 minutes, and got out his watch to time her. Just 6 minutes and 35 seconds later the breakfast was ready to serve.

Out of this incident came "Breakfast in 6 Minutes" as a contest slogan. It had much to commend it. *First,* the interval was a good one; 6 minutes is definite, where 5 minutes can mean anything up to half an hour. *Second,* applying 6 minutes to breakfast cooking was something concrete; gasmen have been talking speed for their product this long time, but have not applied it to a particular function. *Third,* breakfast in most homes is a hurried meal; it was reasonable to expect that housewives would associate the slogan with their own daily performance of the breakfast duties. *Fourth,* gas is the one fuel that can cook this meal in the allotted 6 minutes, from a perfectly cold start.

The next step was to test the idea. Nashville Gas and Heating Co. used several different ranges, all current models, on which to cook a standard breakfast under controlled conditions. There were a number of gas ranges with modern burners and control features. There were electric ranges of latest type, equipped with the so-called high speed units. There were kerosene stoves of the better grades, as well as coal and wood stoves of latest make.

Selected for the standard breakfast was an average American meal—bacon, eggs, toast, and coffee. There was nothing "tricky" about the menu or the proportions. The meal consisted of six eggs, six pieces of toast, six pieces of bacon, and four cups of coffee—enough to feed the average American family of 4.3 people.


TUNE IN WLAC
3 P. M. THURSDAY
for the final matches in the
$500 BREAKFAST COOKING CONTEST
The Championship Contest Between Nashville, Knoxville and Chattanooga Women Will Be Broadcast Friday Afternoon at 3 P. M. Over WLAC.
RECORD TIME FOR COMPLETED BREAKFAST TO DATE IS HELD BY
Mrs. A. B. Wirt
1517 Paris Ave.
and
Mrs. H. T. Kesterson
2221 10th Ave., So.
TIME 4 MINUTES, 12 SECONDS
NASHVILLE Gas AND HEATING COMPANY
ON SIXTH AVENUE



$500 in PRIZES
to find the
TRI-CITIES' FASTEST COOK
Grand Prize
$100
CASH
and a
$125 MODERN GAS RANGE
Second and Third Prizes
(EACH)
$125 GAS RANGES
NASHVILLE'S OWN PRIZES ARE:
First—$125 Modern Gas Range
Second—$50 Modern Gas Range
Runner-Up Prizes to the next 3 fastest cooks and
A Final Entrant to compete for the $100.00 Cash Award
You Can Cook a Complete Breakfast in 6 Minutes or Less?
A simple and profitable way to discover the true merits of Modern Gas Ranges. No meat shrinkage, positive cleanliness, waterless vegetable cooking, time saving and comfort on all seasons.
IF YOU are a good cook . . . a fast cook . . . here is the chance of a lifetime to capitalize on it. Three Tennessee Gas Companies are offering $500.00 in prizes to the women who prepare complete breakfasts in the shortest time. Tests will be held at the Gas Company display rooms beginning Thursday morning at nine o'clock and will continue until contestants have qualified. Qualifying will be held in private test rooms in rear of main floor.
THE RULES
The Contests Will Be Conducted At The Nashville Gas & Heating Co.
221 SIXTH AVENUE, NORTH
THURSDAY—Beginning at 9:00 P. M.
Judges Appointed by Parent-Teachers Association
NASHVILLE Gas AND HEATING COMPANY
ON SIXTH AVENUE

The Leaders
IN YESTERDAY'S
$500 CONTEST
TO FIND
The Tri-Cities' Fastest Cook
Yesterday the first groups of Nashville women tested their skill at cooking. Each contestant prepared this breakfast: Six scrambled eggs, six slices of broiled bacon, six slices of toast and four cups of coffee.
Here are the results:
THURSDAY MORNING—9:30 O'CLOCK
11:30 O'CLOCK
THURSDAY AFTERNOON—2:00 O'CLOCK
3:00 O'CLOCK
4:00 O'CLOCK
The winning contestant in each of the groups above will go into the final contest to compete for the local prize. This is one of the qualifying days.
THURSDAY'S RECORD TIME
WAS SET BY
MRS. ETHEL M. THORNTON
Who Cooked a Complete Breakfast in
6 MINUTES; 43 SECONDS
Preparation Time, 2 Minutes
Actual Cooking Time, 4 Minutes, 43 Seconds
Considering the fact that this is the first form of open competition for most of these ladies, we think they performed excellently. All winners will go into regular matches Tuesday. A few more entrants will be accepted for Monday's qualification.
We take this opportunity to express our appreciation to Parent Teachers' Association for their cooperation in judging
NASHVILLE GAS & HEATING CO.
ON SIXTH AVENUE

Tennessee Tri-City Contest Spotlights Gas as Speediest Cooking Fuel

By GEORGE H. FINLEY
Editor, Western Gas

● Finalists of Tri-Cities cooking contest at work. Time keepers are seen on stairway, judges nearest the contestants, radio announcers by hot water heaters. Mrs. W. B. Martin of Chattanooga, the winner, is center contestant.

The bacon had to be crisp, the eggs done, the coffee properly brewed in a glass coffee-maker, and the toast prepared to a definite, pre-determined degree of brownness. Water was at about 75 degrees, this being average room temperature for the Nashville climate. It is to be noted here that the gas company did not give itself even reasonable credit for a large percentage of its homes having some form of hot water service.

An experienced home economist made all the preliminary tests. In the first test on gas the time ranged from 5 minutes and 35 seconds to 6 minutes and 40 seconds. It took approximately twice as long for the bacon, eggs, and toast, on the electric range as it did on the gas, and the coffee very much longer where the glass coffee-maker was used. While use of an electric percolator will speed up the coffee-making time, it is well known that 10 minutes is about the best speed that can be expected for properly percolating coffee by this method. The coffee-brewer with the electric unit required 12 minutes and 40 seconds.

Toast from the gas ovens was noticeable for its superior quality.

Other interesting facts developed through these tests. One was that new cooking utensils when removed from the top of the electric ranges were definitely dirty from sticky substances or grease effects which had stuck to the electric unit. With the more expensive type electric elements the amount of cooking filth was not nearly so noticeable; these units, of course run up the cost of electric ranges considerably.

There were no signs of grease, sticky substances, or other dirt on the bottom of the vessels that were used over the modern type gas range burner. It is also worth mention that the company did not clean the gas top burners used during the demonstration, as it was desired to make a positive showing on the cleanliness point.

Coal and kerosene ranges were even slower than the electric, and it was not possible to toast bread properly with the kerosene range.

All of the above tests were made in local homes, and under actual home conditions, with every precaution observed to make results truly comparative.

Having demonstrated what gas ranges would do in their own territory, those in charge of the plan began to prepare the contest details. Gas properties in Knoxville and Chattanooga came into the contest along with Nashville, and the event was set up as a Tri-Cities Breakfast Cooking Contest.

It was decided that each property would give its local contest winner a $125 range, and that a $100 cash prize would be awarded the "State Champion," as selected in the finals of the three local contests. Details were virtually the same in each of the three towns, though selection of the particular range to be featured was left to local executives. All ranges were set at a definite B.t.u. consumption, with necessary governors.

Contest arrangements began about December 1. Teaser ads in local papers were followed with a large announcement advertisement, giving rules of the contest, etc. As the contest proceeded, daily ads were run to stimulate interest, giving names of the various entrants and their respective cooking times. Newspapers ran photographs and news stories at frequent intervals.

The women qualified in groups of five or more, the winner in each group being eligible to compete in the run-offs. There were 16 of these qualifying entrants, and these participated in regular matches, one woman competing against another with the winner from each match going into the next bracket. The winner in the finals of this "match play" received the $125 range and an opportunity to compete in the state finals.

Qualifying time in the local contests ranged all the way from 4 minutes and 41 seconds to 9 minutes and 12 seconds. After the regular matches started and the women were more accustomed to the ranges the time never exceeded 6 minutes.

Parent Teachers Association representatives were secured as judges, which practically eliminated any possible

(Continued on Page 24)

● Billboards, as well as newspapers and radio, carried the "Breakfast in 6 Minutes" idea to Southern housewives. ●

"THE EXPLOROSCOPE"

for interior inspection of mains

THIS instrument will satisfy a general curiosity to see the interior of a pipe line while the line is in operating service. The instrument has sufficient utility to enable the operator to secure a photograph of considerable area of the exposed interior. As a new tool for the gas man, it has novelty and utility with simplicity in application.

W. M. HENDERSON

This instrument was conceived and created in the course of a fact-finding study of the phenomenon of dust, its cause, effect and elimination. The two engineers engaged in the problem of dust recognized the desirability for a means to observe the pipe interior, so they proceeded to design and construct the "Exploroscope." If any value comes to others through use of the device, then their appreciation and blessings may be bestowed upon T. G. Wallace and R. G. Holman of the Los Angeles Gas and Electric Corp. research engineering staff who designed and built the apparatus here described.

The essential features of the instrument are that it can be inserted into a gas main under pressure by means of a gate valve and packing gland; it provides its own source of illumination within the pipe interior; it permits ocular inspection of the inside pipe walls entirely around the periphery of the pipe; permits photographs in more detail than is disclosed to the eye, and by longer exposures a photograph can be taken of interior sections that are actually too far from the instrument to be seen with the eye.

The accompanying illustrations show the instrument and some of the results obtained with interior photography. The Exploroscope is now only in its development stage. By use and experiments its scope will develop. A description of the instrument now in use may be of value to others who are interested in exploring the interior of gas pipes while they remain in service.

The Exploroscope proper consists of three optical units: the standard interchangeable microscope eyepiece (1), the inverting lens (2), and the objective lens (3), each being a combination of two achromatic lenses. The eyepiece slips into its barrel mounting (4), which screws into brass sleeve (5) forming a telescoping unit for focusing.

The lock screw (6) bears against a tongue or fiber tube (7). By releasing the lock, the eyepiece and its mounting can telescope, thus changing the distance between the eyepiece and the inverting lens for focusing.

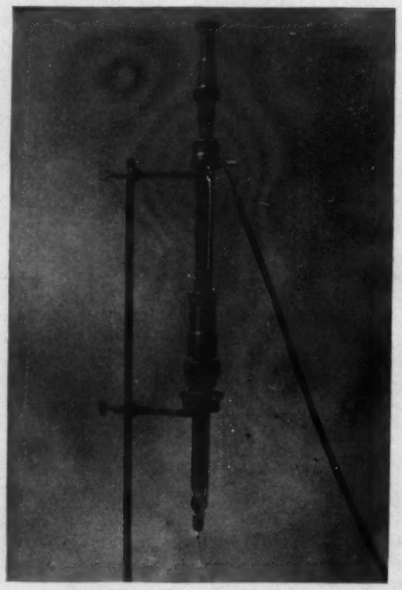


FIG. 1. General view. Note lamp globe at bottom.

The fiber tube (7) is pinned to knurled adjusting nut (8). The inverting lens (2) in its brass mounting (9) screws on to the fiber tube (7).

Fiber tube (10) through brass bushing (11), screws into brass lens mounting (9).

Objective lens (3) in brass cap (12) screws on to brass mounting (13) which screws to fiber tube (10). A small threaded brass bushing (14) is pinned to fiber tube (10).

When knurled nut (8) is turned, fiber tube (7), inverting lens (2), and its mounting (9), fiber tube (10), the objective lens (3), and its mounting (13) all screw as a complete unit along threads on bushing (14) and brass tube (15). These threads hold the entire unit against the force of pressure.

The bottom of the fiber tube (10) bears a rack (16) and its extension. It slides through its guide sleeve (17) as the fiber tube moves longitudinally due to the rotation of the knurled nut (8). The movement of the rack (16) causes a rotation around bearing (18) of gear (19) to which is fastened the lamp and its socket, by means of the hanger (20). There are two such hangers and bearings, and the prism is mounted between them. Light enters the prism through the outer small face, is reflected internally at the hypotenuse, through the upper face into the objective lens.

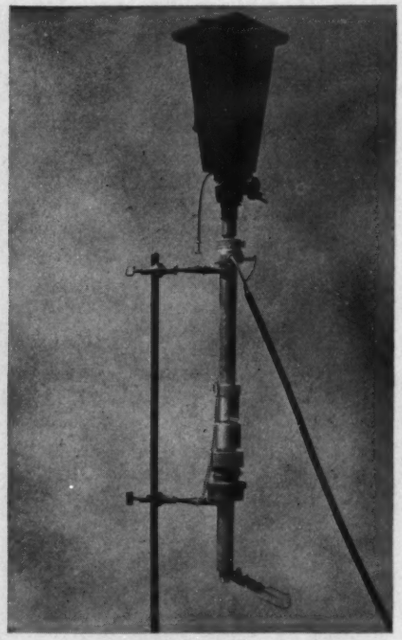


FIG. 2. Camera attachment.

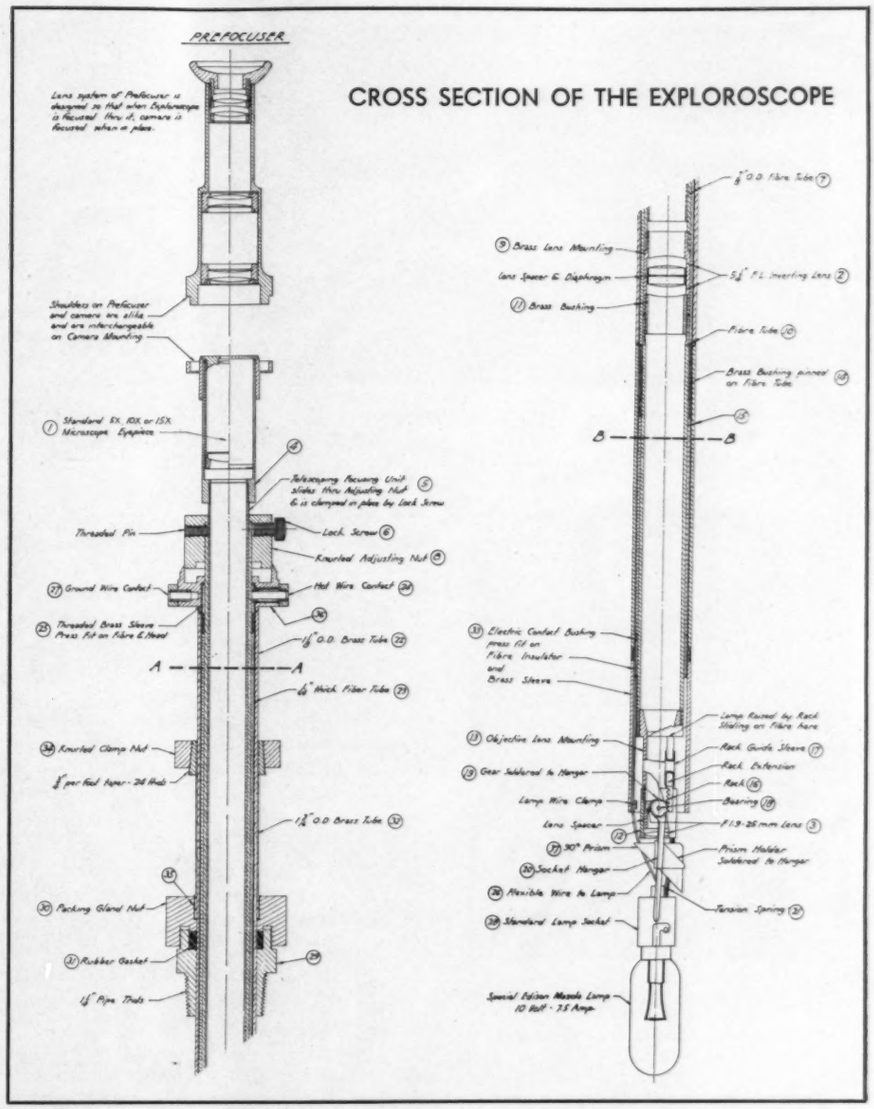
By turning the knurled nut (8), the prism is tilted so that one can traverse a pipe some distance from the Exploroscope. Further turning swings the prism and the lamp to a horizontal position, and the immediate bottom comes into

By W. M. HENDERSON
Superintendent of Distribution
Los Angeles Gas and Electric Corp.

view. When turning the nut (8) counterclockwise, the lens unit is raised and the tension spring (21) returns the prism and lamp to a vertical position.

The brass tube (15) is pressed into brass tube (22), separated electrically by a thin fiber tube (23). This unit of three tubes forms the positive and negative conductors for the lamp; the outer, being the ground. The "hot" wire plugs into its contact at (24) and screws into brass sleeve (25), an extension of (15), through which the current travels downward to contact bushing (33) and flexible wire (26) to the lamp. The ground wire connects to the head at (27), to outer tube (22), through both rack and bearings to the hangers and outer socket case (28).

The packing gland assembly (29) screws into a 1¼-inch valve fastened to the gas main. The packing gland nut (30) forces the rubber gasket (31) against the brass tube (22) so that when the instrument is inserted through the valve and the packing gland nut is tightened by hand, it will not leak gas at 60 pounds. Since, in removal, the instrument must be drawn out high enough for the lamp to clear the valve body in closing, the bottom of brass tube (22) leaves the rubber gasket (31) and rises into the brass tube (32) where



*Mr. Henderson's description of the Exploroscope, published herein, appeared originally in the American Gas Association Monthly for February; and Fig. 1 to Fig. 8 are reproduced by courtesy of the same publication.

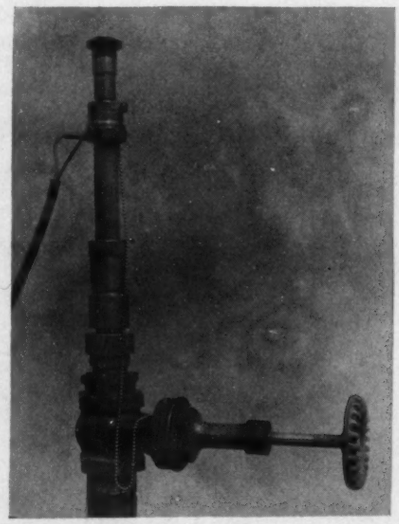


FIG. 3. Method of insertion through gate valve.

it is locked in place by the clamp nut (34). Upon inserting the instrument, the packing gland nut (30) is relieved and the gland is slid downward till the lamp is entirely within the 1¼-inch threaded portion. Then the knurled clamp nut (34) is tightened and the instrument screwed into the gate valve or its bushing. The valve is then opened, knurled nut (34) relieved and the instrument inserted against the pressure. At any desirable depth, the packing nut (30) is tightened by hand and clamp nut (34) also, as an added precaution. To rotate the entire instrument, packing nut (30) is relieved and brass tube (32) turns in the fine threads of nut (30), at (35). Packing nut (30) can then be clamped in place to prevent leakage of gas. In removal, when both clamps must be loosened and pressure opposed, the chain from (36) to (30) prevents blowing out of the instrument.

The objective lens has a focal length of 25 mm. or 1 inch. Since the field of vision depends upon the distance of the image to the lens and the size of the image, and the latter is restricted to ½-inch diameter, it is desirable to have the focal length as small as possible. This gives the apparatus its wide angle of almost 25 degrees.

It is imperative to have an objective of short focal length because the displacement of its image is small for large changes in distance of the object. The Exploroscope shows—in Fig. 8—a section of pipe 2 feet away, as well as 7 feet away; both are in focus. This condition is highly desirable.

The image formed by the objective lens (3) must be cast upon the focal plane of the eyepiece (1), which is, in most cases, between its own lenses. Since the objective lens is in the main pipe and the eyepiece is above the gate valve, some means of transferring the image to the eyepiece is necessary. The inverting lens (2) is chosen for this purpose, transferring the image from (3) to the focal plane on (1). In this transfer, the image is inverted and slightly increased

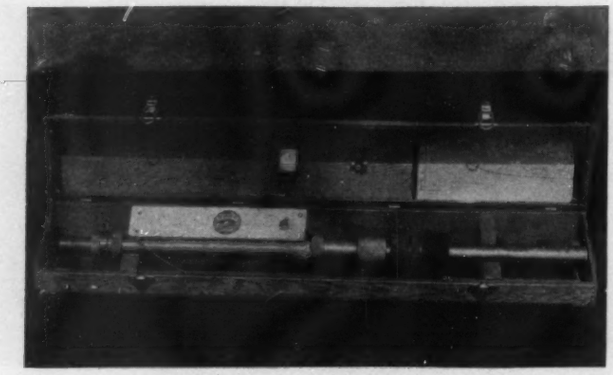


FIG. 4. Carrying case—open.

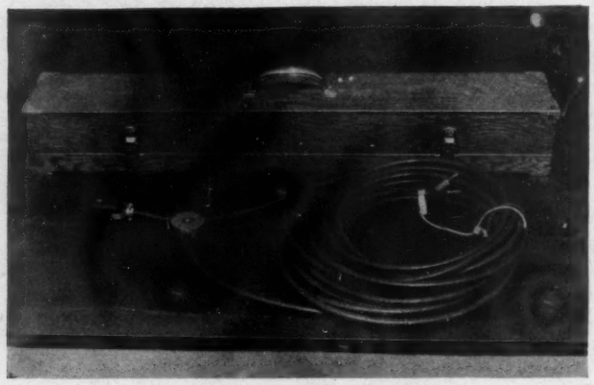


FIG. 5. Carrying case and lead wires.

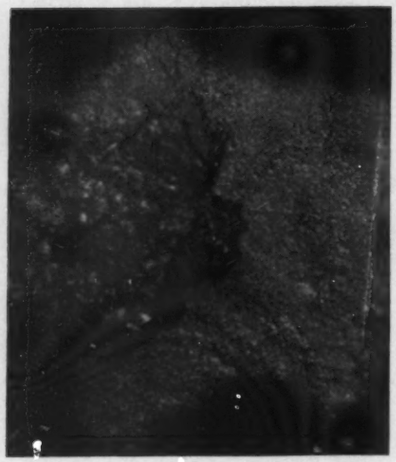


FIG. 6. Pipe interior photograph (sidewall of 16-inch pipe, near bottom, shows scale on 3-inch circle of pipe surface).

so that it occupies the entire field of the eyepiece. One inversion occurs through the prism (37), reinverted through the objective (3) and inverted again at (2), so that when one looks through the eyepiece with the object ahead of him, away from the observer is the bottom of the pipe, and towards the observer is the top. In looking along the bottom of the pipe, the part close to the lens is always more highly illuminated than the part farther away. In all our perspective photographs, the direction of the rays can be determined by drawing a line from the light to the dark section.

The small lamp used is the most powerful type of its size obtainable, a special Mazda 10 v. 7½ amp., having a life of 50 hours. Electricity is derived from 6 v. storage batteries, adjusting the current to 7½ amperes by adding or eliminating cells in series. The current is measured by means of an ammeter housed inside the Exploroscope carrying case, and if the lamp burns out, a loose connection occurs, or if for any other reason the current drops below 6½ amperes, a relay operates a buzzer, calling the attention of the operator that investigation is necessary. This is very important in long exposures where constant attention would otherwise be required. The ammeter, relay, buzzer, and 3 v. dry cell, and master switch are conveniently housed in the case.

When the Exploroscope is focused down a pipe and the distance from the bottom of eyepiece barrel (4) to the top of nut (8) is measured, reference to a chart on the inside cover of the carrying case shows directly the distance of the object, and the size of the field.

The prefocuser is used for focusing the Exploroscope when photographs are to be taken. The camera used is a "K" type, microscopic, lensless camera. When the Exploroscope is used for ocular investigation, all rays leaving the eyepiece are focused to infinity. They are, of course, intercepted by the eye, but this has no bearing upon the system other than the nearsightedness or farsightedness of the operator, in which case an additional correction may be necessary. With the camera in place, the above rays must come to a focus at the surface of the film which is approximately 10½ inches from the eyepiece. Since the rays diverge from the eyepiece covering a 3¼-inch by 4¼-inch film, the intensity of light is greatly diminished, and the camera cannot be focused on a ground glass instead of on the film. The prefocuser is an optical system of four achromatic lenses, so designed that when it is placed upon the eyepiece of the Exploroscope and the entire instrument focused through it, the rays leaving the Exploroscope eyepiece are focused 10½ inches from it, so that when the prefocuser is replaced by the camera, the rays come to a focus on the film. With the prefocuser in place, all of the light leaving the eyepiece of the Exploroscope enters the eye through the prefocuser, so that its intensity is very much greater than that which falls upon the film. Usually the intensity is so low that an exposure of 30 minutes or more is necessary on super-sensitive panchromatic film.

FIG. 7. Pipe interior photograph (sidewall of 16-inch pipe, near bottom, shows scale on 3-inch circle of pipe surface).

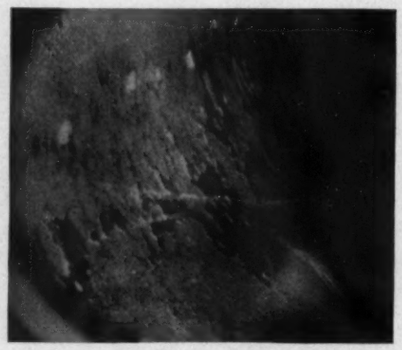


FIG. 8. Pipe interior photograph (looking along bottom of 24-inch pipe for distance of approximately 7 feet).

It is the opinion of the designers that now, after a year's experience with the present instrument, they are satisfied that an instrument of this type can be

(Continued on Page 62)

CHARTING THE SALES COURSE

Plans and Policies for More Effective Promotion Reported to A. G. A. Regional Sales Conferences

IN the following pages *Western Gas* offers a running digest of numerous papers from the Eastern and Mid-Western sales conferences conducted by the American Gas Association last month at Pittsburgh and Chicago, respectively. Papers from the program of a third regional sales conference, held in New Orleans the latter part of February in conjunction with the annual convention of the Southern Gas Association, will be reviewed next month. General proceedings at the New Orleans meeting, including elections of Southern Gas Association officers, are covered elsewhere in this issue.

The Eastern Natural Gas Sales Conference, in session from February 6 to 8, was presided over by George L. Scofield of the Republic Light, Heat and Power Co., Buffalo, N. Y., as chairman. It drew an enthusiastic attendance of some 250. Hulda Ungericht of The Ohio Fuel Gas Co., Columbus, was chairman of the home service breakfast and program held at this conference, on Saturday, February 8.

Sessions of the Mid-West Regional Gas Sales Conference on February 13-15 commanded the largest registration at any of this group's meetings, totaling 334, with Illinois, Indiana, Wisconsin, Michigan, Missouri, Iowa and Ohio ranking highest for attendance in states represented.

Henry J. Dropp of the Milwaukee Gas Light Co. was named as chairman of this conference, with C. A. Luther of The Peoples Gas Light and Coke Co., Chicago, in charge of arrangements. Heading this group next year is J. Frank Jones of the Battle Creek (Mich.) Gas Co., this year's vice-chairman. A home service luncheon held Saturday noon was attended by 50 conference delegates. Irene Hickey of the Detroit City Gas Co. was chairman in charge of the home service phase of this conference.

C. B. Wilson of Little Rock (Ark.) Gas and Fuel Co. headed the sales conference committee for the New Orleans conference, and presided over these sessions. There were upwards of 250 in attendance at the New Orleans meetings, which offered a comprehensive program of technical, industrial and sales subjects due to the combination of Southern Gas Association proceedings with the sales conference. Albertine Berry of the Lone Star Gas Co., Dallas, Texas, was in charge of home service features at this meeting, a breakfast and program being conducted on Saturday morning, February 22.

Further details on the Southern Gas Association and Sales Conference meeting at New Orleans will be found on another page.

The regional sales conferences of the A. G. A. are a valuable activity carried on each year by the Commercial Section, of which J. W. West, Jr., is secretary.

Eastern Natural Gas Sales Conference Reviewed

A KEYNOTE of optimism was sounded for the Eastern Natural Gas Regional Sales Conference by C. E. Bennett, of the Manufacturers Light and Power Co., Pittsburgh, Pa., who is this year's chairman of the A.G.A. Commercial Section. Mr. Bennett stated that the gas utility business has become such a vital part of the life of every community that any interference, political or otherwise, that would impair the service or increase its cost would not long be tolerated. There are many reasons for an optimistic sales outlook for the immediate future. The natural gas industry closed the year of 1935 with the largest number of customers ever carried on its lines—6,029,000, a 3 per cent gain over 1934. Thirty per cent more ranges were sold in 1935 than in 1934, and 56 per cent more refrigerators; 250,000 automatic water heaters were sold in 1935.

Augmented sales effort and promotional rates are needed, however, to cope with increasingly intensive competition, and a decided increase in sales force is necessary. Where the gas industry averages about one salesman to every 3,000 customers, the electric industry's average is one salesman to 400 customers (dealer outlets considered). More effective dealer cooperation is one obvious answer.

More advertising, and especially national advertising is another urgent need. The industry now spends but 40 cents per customer per year, or 6/10 of 1 per cent of annual revenue in advertising—a paltry amount considering the need.

Need for National Advertising

Discussing the present plight of the gas industry as a result of electric competition, Herman Russell, president of the Rochester (N. Y.) Gas and Electric Corp., asserted that the gas man is the "forgotten man" of industry. This has come about through a neglect of advertising, and an aggressive program of national advertising and publicity is the obvious and certain remedy. Mr. Russell is chairman of the A. G. A. committee charged with the responsibility for initiating such a program for the industry.

What's Ahead for Gas Water Heating?

Charles L. Yost, United American Bosch Corp., laid the blame for decreasing gas water heating sales, and the possibility of continued trouble in water heating, on the old style range boiler with side arm heater or underfired burner, still used so largely in many sections. In addition to inconvenience, odor, and possible danger from fumes, the cost of such water heating, on the basis of 1,500 gallons per month, 100 degree rise, and natural gas at $0.60 per Mc.f., is $2.25 per month, making it competitive with off-peak electric heating at $2.50 for a similar service.

The modern gas automatic water heater does the same job at $1 per month, and its installation is the answer to the problem.

New Methods of Selling Modern Gas Cookery

The problem of maintaining the gas range load is not one of selling the desirable features of the gas range so much as selling the desirability of gas cookery and the advantages of gas as the preferred fuel, in the opinion of Paul Dorsey, Cribben and Sexton Co., who spoke to the conference on this topic. To intrench itself in the cooking field the industry must:

1. Create consumer preference for gas fuel for cookery by causing the fuel to be more appreciated.

2. Lessen the vulnerability of the gas industry's position by removal of antiquated gas ranges now in service.

3. Impede future electric range sales and remove electric ranges now in service.

4. Remove all other types of competitive fuel-consuming cooking appliances.

These aims can best be achieved not by selling range "talking points" and surface refinements, but by creating a demand for the highest standards of cooking performance, and associating this performance with gas.

Home Insulation and New Building Prospects

J. H. McKay, Johns-Manville Corp., New York, estimated that 200,000 housing units will be built in 1936, 45 per cent of which will be single family dwellings, presenting a quality market with respect to construction and equipment. Modernization, too, will continue apace. Such a building program should be very alluring to the gas heating industry as offering a market for superior gas fuel with its convenient controls, particularly in insulated houses where heat is conserved. The primary sales appeal for insulation is that of all-year-comfort, which ties in completely with gas sales promotion.

Insulation and Its Relation to Gas Sales

Michael Waroblak of the Hope Natural Gas Co., Clarksburg, W. Va., described methods used to obtain gas heating load in newly built homes, in the face of competition from local low-cost coal.

The approach was to advocate house insulation, with its consequent heat conservation making low gas bills possible. Heating requirements were figured with and without insulation, this being very impressive to the prospective home owner, and giving him a feeling of confidence and goodwill toward the gas company.

This company finds that selling the idea of insulation breaks down resistance to the cost of gas heating, and opens the prospect's mind to the merits of gas equipment. The company cooperates with building materials firms in promotion of insulation, and in turn secures many house heating leads from these dealers. Use of gas heat in an insulated building brings invaluable word-of-mouth advertising for gas, due to fuel savings and customer satisfaction resulting from them.

This company's experience has been that the average two-story building, using a bat form of rock wool or glass wool in all walls and ceilings, heat loss can be reduced 39 per cent. If only roof insulation is used a heat saving of 23 per cent can be made. As a result of these house heating sales efforts, out of 61 houses and apartments built, 35 were wholly or partially insulated and 42 installed gas heat.

Progress in Winter Air Conditioning

An impressive picture of past progress and future possibilities for winter air conditioning with automatic heating was painted for the conference by Geo. Boeddener of the Fox Furnace Co., Elyria, Ohio. He pointed out that there are 11 million central heating systems installed in the United States, made up of about 8 million furnace installations and about 3 million radiator systems. Only about 1½ million of the 11 million are automatically controlled.

To demonstrate that winter air conditioning has made long strides in recent time, it was stated that a cast iron gas-fired air conditioning unit of 140,000 B.t.u. input rating, which five years ago sold complete to a dealer for something over $500, now sells for half that amount, and is a vastly improved product.

In 1935 winter air conditioning increased its unit sales 125 per cent over 1934 and about 3,000 per cent over 1931. This year will exceed 1935 by 100 per cent. It was predicted that by 1940 the industry will sell 400,000 units per year for new and replacement home installations. Modernization business is important, as there are nearly 10 million manually controlled home heating units waiting to be replaced.

The American public is becoming automatic heat conscious with the same enthusiasm accorded automobiles, automatic refrigeration and radio. With new firms entering the field each year the industry will soon be spending from 25 to 50 million dollars annually to promote winter air conditioning and automatic heat, which will create substantial markets for all kinds of automatic fuel. Gas will participate to the degree that it aids in the promotion of this field.

Commercial and Industrial Heating

Basing his remarks on the actual experiences of several natural gas operating utilities, George P. Mandel, of the Surface Combustion Corp., Toledo, Ohio, discussed methods for obtaining the commercial and industrial gas load.

The markets most readily at hand are to be found in the buildings already equipped with a boiler or furnace, in which a gas burner or automatic conversion may be installed, and in the building, store or shop not equipped with a central plant, which latter can be best taken care of by a gas-fired unit heater. Heretofore the unit heaters have been considered by many as applicable only to factories and large industrial plants, but they are now sold successfully for use in small establishments, and because of ease of installation, portability and operating characteristics can often be installed on jobs that otherwise would go to other fuels.

Unit heaters are made in a variety of sizes, are neat and attractive in appearance, are fully automatic and safeguarded against varying gas pressure, gas failure, and electric current and fan failure, and automatically control room temperature within close limits. Operating costs are low and dependable so that close estimates can be made.

It has been found advisable to delegate the sale of this equipment to the retail domestic salesman, as well as to the industrial or commercial sales department. While the salesman need not be a skilled engineer, he should be given assistance and close supervision by the heating supervisor. There should be one supervisor for each six or eight salesmen, whose duty is to check all surveys, recommendations and estimates. Installation crews should be well instructed and supervised on the first installations, upon which future sales are built.

The average unit heater sale adds 170 Mc.f. of natural gas annual load in territories having 5,700 degree days.

Experiences in Space Heating Sales

H. B. Yost, Hope Natural Gas Co., Clarksburg, W. Va., told of experiences in his territory, which is in the center of a natural gas producing field, but was nevertheless losing considerable sales because of coal competition.

Six years ago the company made a domestic survey of its system. From this survey the following facts appeared:

About 85 per cent of the customers were using space heaters to do their entire heating.

Most of the people using space heaters were troubled with condensation to some extent, and that in many cases frost and ice formed on the walls.

Practically the only flues available were fire places; many homes were without any flues at all.

In most cases where coal had displaced gas, it was in an effort to eliminate condensation.

Although not recognized by most customers, inadequate heating existed in most homes.

Much of the equipment used was either antiquated or of cheap construction.

The coal furnace salesman used the argument that the customer could eliminate sweating, get better heating conditions, and save sufficient money by burning coal to pay for the furnace in a short time.

Most of the homes either had no cellar at

all, or at best a very small portion of the potential cellar space actually excavated.

The flues were very cheaply and loosely built, flue tile being practically non-existent in chimney construction.

With the above in mind, it was decided to promote the sale of gas heating equipment having the following characteristics:

Completely vented.

Flue exit suitable to vent into a fireplace without any dip in the flue.

Thermostatically controlled. (This feature was strongly advocated, but not insisted upon; 95 per cent of the heaters sold were equipped with thermostats.)

Must furnish radiant heat as well as indirect heat (that is, circulated heat).

Since the beginning of activities, additional space heaters, including floor furnaces, have been included, and a choice of various styles and sizes from 20,000 up to 100,000 B.t.u. input is now offered.

There has been added, either in new load or load recaptured from our coal competitors, more than 50,000,000 cubic feet annually. In addition, hundreds of customers formerly dissatisfied now enjoy real satisfaction with the use of gas heat. Practically no purchasers of gas heaters have subsequently put in coal equipment.

Paul W. Dunn of Brownsville, Pa., reported experiences of the Greensboro Gas Co. in promoting the warm air circulating heater and the suspended type with fan forced circulation.

In all applications, the problem of venting is perhaps the most perplexing, for even though flues and chimneys are available they must be carefully examined and tested to see if they are open and capable of providing adequate draft.

Automatic controls have been used on all recent installations, gas-actuated thermostats on the circulators and electric controls on the suspended unit heaters. The value of these controls, as a factor of economy, controlability, and convenience, justifies the additional cost. There are, however, some installations that are very difficult to control from return air temperatures, and in a few cases it was found necessary to raise the control up off the floor with a remote control extension.

Answering the question "Is there a sufficient space heating market available, and is the revenue derived of great enough importance to warrant a definite, aggressive sales effort?" Frank D. Howell, Dominion Natural Gas Co., Ltd., Brantford, Ontario, Canada, told how, during the fall months of 1935, The Dominion-Republic group of properties, comprising several small cities and towns in Western New York State and the southern portion of the Province of Ontario in Canada, featured a "Fifty Day Home Comfort Sale" of heating appliances. In addition to the sale of 400 automatic house-heating installations and 1,043 radiant-type heaters, 565 circulating type heaters were sold.

Approximately 90 per cent or 515 of these circulating heaters had input ratings ranging from 40,000 to 60,000 B.t.u. Of the total, 358 or 64 per cent were to take care of the customers' full heating requirements. The remainder were auxiliary or additional to other heat. The estimated revenue from these 565 units is 33,000,000 cubic feet annually. This is considered load equivalent to approximately 2,000 gas ranges or about 1,300 storage systems. Where a circulator is used for the customer's entire heating requirements two were found to be equivalent to one house heating installation. A survey of the heaters used as *additional heat* leads to the belief that three circulators will produce as much revenue as one average house heating installation.

Automatically controlled equipment provided the greatest sales appeal in this campaign. Allowing a proof trial of the heaters was a standard offer on automatically equipped circulators, being credited with producing a large number of sales and resulting in less than 10 per cent removals after trial.

The operating department, selling after hours with the stimulus of a liberal commission, was responsible for more than 50 per cent of the circulating heater sales.

Mid-West Regional Sales Conference

GAEL SULLIVAN, Associate Director of Federal Housing, Chicago, Ill., gave the keynote address for the Mid-West Conference, briefly explaining the National Housing Act and its assistance to gas load building. Insured loans for household modernization and enlargements under Title I recently have reached a weekly average of $7,000,000. Over $277,000,000 in such loans have been insured, representing over 781,000 individual jobs. It is estimated that for every dollar loaned six are spent from savings, and no doubt the kitchen and basement come in for a large share of this. Under Title II, additional millons are being spent upon new construction and existing construction; the latter being contingent upon completion of necessary repairs such as installation of adequate heating equipment.

To realize the most out of this potential market the public must be made "gas conscious" by aggressive merchandising methods on the installment selling-time payment plan. Try to sell a kitchen rather than a cooking appliance; a basement playroom rather than a basement heater.

Accomplishments in Gas Range Sales Promotion

E. R. Guyer, representing the A. G. A. Domestic Range Committee, reviewed the set-up of the 1936 national gas range contest, details of which appeared in *Western Gas* for February. Last year's contest was influential in raising the total of heat controlled range sales 52 per cent above 1934, and expectations are that the 1936 contest will lead to even greater achievements. Mr. Guyer made the point that gas range promotion to date has lagged far behind that put forth for electric ranges and other household commodities. Where electric ranges carry from $5 to $10 promotional allowance per unit, gas range manufacturers and merchandisers have been too price conscious to add any promotion allowance worthy of the name to their wares.

A. C. McKinstry of Cedar Rapids Gas Co. reported on his company's range activity in Cedar Rapids, Iowa, where 800 new ranges were sold in six months, on a system with 12,250 domestic gas meters. One specific gas range model was selected, to retail at $89 on a rental-sale basis of $1 down, plus $1.39 tax, and $1 per month (later changed to $1.50) these monthly payments to be made either with the monthly gas bill or at the dealer's office. While the public generally preferred to pay the gas company, the optional agreement satisfied the dealers who liked willing customers to come into their stores where other merchandise might be seen.

The high quality gas range insured customer satisfaction and a minimum of gas company service calls (which cost $1 each by the company's records). At the same time, the $1 monthly payment placed no burden on the purchaser and enabled him to finance additional gas equipment brought to his attention because of gas range ownership. The dealer received $69.50 in cash on tendering each rental contract to the gas company on installation of a range. The dealer delivered and uncrated the range and either paid $2.75 to the gas company, for installation, or turned the installation over to local plumbers. No trade-in allowance was made. The gas company reserved the right to approve the credit arranged by the dealer, but

after acceptance of contract there was no recourse on the dealer. Extensive cooperative newspaper advertising, cooking schools, and intensive personal sales work were chiefly responsible for success of the effort.

C. R. Henderson told how the Wastenaw Gas Co., in Ann Arbor, Mich., a university town of 8,300 domestic gas meters, decided that the problem of competitive fuel presented by the aggressive local power company could be met only by replacement of all antiquated gas ranges with modern gas equipment. An "Old Range Round-Up" was featured for a 60-day period in the Spring of 1935. The newspaper mats and other assistance furnished by the American Gas Association contributed materially to the success of this campaign.

A very liberal allowance was made for old gas ranges turned in. All employees were enlisted, and set up in competitive team groups, together with four outside and two inside full time salesmen. Twenty-three per cent of sales were made from employee prospects.

A down payment of $1.75 was decided upon, with two years to complete the balance, in monthly payments. No repossessions have been found necessary. In the 60-day campaign, 208 ranges were sold at an average price of $79, before allowances. The following September a somewhat similar 60-day campaign was put on with equally good results, producing a total for the year of over 500 gas ranges, an increase of 49 per cent over 1934.

Rental-Purchase Plan of Gas Service Company

F. M. Rosenkrans, Gas Service Co., Kansas City, Mo., presented the details and results of a rental-purchase plan operated by his company, which placed five times as many automatic gas water heaters on the lines of the Gas Service properties in 1935 as were installed in 1934, with little increase in sales personnel and practically the same advertising appropriation.

Analysis of the potential market had shown that 75 per cent of the domestic customers who used gas for cooking were not equipped with automatic storage water heaters. While some had tank water heaters, these were only used in the summer in the majority of cases, furnace coils being utilized during the heating months. A further analysis, of percentage of customers living in rented houses, showed that while this class was comparatively negligible in the farming territory it ranged as high as 45 per cent in the larger centers. It appeared that it would be an almost impossible task to sell automatic water heating to the landlord or owner of rented property, for the use of his tenant, and that some easy means of placement would have to be adopted. All the information available was reviewed, the report of the subcommittee of the Commercial Section, A. G. A., showing the success of the rental-sales plan of selling, being particularly impressive. It was finally concluded that the basic point in all the plans was long term payments, extending up to six years, which would result in very small monthly installment payments on the part of the customer, to rent or eventually purchase the heater.

Under the rental plan adopted, the company proposed to furnish, install and maintain at its own expense a water heater of suitable size for the average residence, in consideration of the customer paying small monthly rental. The heater sizes, and rentals, were as follows:

Galvanized Heaters: 20 gallon, $1.00 monthly rental; 30 gallon, $1.25 monthly rental; 40 gallon, $1.50 monthly rental.

Copper Heaters: 20 gallon, $1.50 monthly rental; 30 gallon, $1.90 monthly rental; 40 gallon, $2.50 monthly rental.

These monthly rental payments amortize in approximately 60 months the cash sales price of the heater, plus carrying charge of five per cent per year. Copper heaters were included because in certain territories water conditions are such that a large percentage of galvanised tanks would become defective before the company could amortize its investment.

The rental agreement placed no obligation on the customers other than to pay the monthly rentals until such time as they desired the heater removed, but carried a purchase option showing the purchase price of the appliance on a 62 months term basis including carrying charges. The customer could purchase the heater at the price placed in the contract, less credit for all rental payments made and a 20 per cent discount for cash, which discount really represented the balance of the carrying charges.

The salesman's compensation for securing a water heater rental contract was two-thirds of the commission percentage paid for securing a sale; the remaining one-third of the regular sales commission, plus a bonus, was paid for converting the rental into a sale.

For the year of 1935, as a result of these activities, 6,730 water heaters were placed on the lines, after deducting all returns. Returns were 5.7 per cent on sales and 7.8 per cent on rentals, the latter including customers who moved; in some of the latter instances the heater was rented to the next tenant. Out of the 6,730 heaters installed, the net sales were 1,570, a number in excess of the direct sales in 1934.

Straight Selling Plans

An aggressive straight selling plan was detailed by K. F. Dickinson, Public Service Co. of Indiana, Lafayette. This company decided, a year ago, to stimulate lagging domestic gas sales, with the opinion that automatic gas water heaters offered the best sales medium, if assisted by a promotional gas rate, a liberal sales policy to both purchaser and salesman, a proper tie-in with the plumbers and dealers, a well balanced advertising program, a bonus for prospects turned in by non-salesman employees, and intelligent co-operation of the manufacturer of the selected water heater.

Lafayette and West Lafayette, the former a diversified city with 6,900 domestic meters and the latter a college town, both served by a common distribution system, were selected as an example for discussion. In March, 1935, a residential gas rate of straight block form was inaugurated as follows: first 2,000 cu. ft., $1.40 per Mc.f.; next 3,000 cu. ft., $0.70 per Mc.f.; next 5,000 cu. ft., $0.60 per Mc.f.; all over 10,000 cu. ft., $0.50 per Mc.f.; the gas averages 570 B.t.u. per cu. ft.

Advertising was built around daily newspapers, sales window displays, and direct mail pieces ahead of salesman's call. All installations sold by the company were made by local plumbers, checked by the company and found uniformly satisfactory. Sales terms were as low as $2.50 down, with as long as 36 months to pay, with a 12 per cent carrying charge. At any time customers could close account by paying in full.

Salesmen were paid 10 per cent commission on cash price of heater (not installed) less all trade-in allowances; also a bonus of $1 per heater for the first 10 heaters, increasing to $7 per heater for over 40 heaters. Non-salesman employees who furnished a prospect who actually bought were paid $2.50.

A survey was made of customers who had automatic water heaters operating inefficiently or shut off because of expense; this group were good sales prospects. Customers without automatic heaters were next visited. During 1935, 283 new automatic water heaters were placed, with an average increased usage of 1,690 cu. ft. of gas per month per customer sold. Of these sales 42 per cent were from prospects turned in by non-sales employees.

(Continued on Page 32)

"Bake More— because it costs less"
THE infinite variety of quick breads, yeast rolls and biscuits that the home cook can master without a single trial fill giant cook books. For the sake of time and space we merely list one of the best with full assurance that it will delight your family. Stir it up, let it rise, stick it in the oven, take it out and watch the family make it disappear. As pleasing as the taste is the cost for gas. . .
Four dozen rolls for less than a cent
Could anything cost less? Yes, double the recipe and put the extra rolls in the oven at the same time . . . the cost per dozen would be still lower. Need anything cost less? Certainly not home baked rolls, and that is why we urge you to bake more, because it costs less. Take advantage of the 8c per hundred cubic feet additional use gas rate.
YEAST ROLLS
Your Gas Rates are Bargain Rates
WISCONSIN PUBLIC SERVICE CORPORATION
"Roast More . . . because it costs less"
ROAST BEEF
PHONE OUR HOME SERVICE DEPARTMENT FOR OVEN MEAL RECIPES
THE modern gas range offers you the most economical of cooking methods . . . complete oven cookery. Select your meat, always an economical cut because gas range roasting will make it tender, add to it your dishes of vegetables and a pudding dessert if you desire. Your gas range oven will cook them all at the same time.
The cost will be 2c for the entire meal
You can have the most attractive, well-done full oven meals for that low cost, especially if you take advantage of the new 8c per hundred cubic feet gas rate (the additional use rate). Enjoy easily prepared, time saving and appetite pleasing full oven meals . . . roast more, it costs less.
Your Gas Rates are Bargain Rates
WISCONSIN PUBLIC SERVICE CORPORATION

Samples of advertising designed to cash in on low cost gas rates introduced by Wisconsin Public Service Corp.

BARGAIN GAS RATES

INTRODUCING his company's low cost rate plan before the recent convention of the Wisconsin Utilities Association's Technical and Operating Section, Mr. Miller first commented upon some of the underlying conditions which promotional rates must be designed to meet. If the trend toward diminishing returns from domestic sales is to be halted it must be through more general use of gas for water heating, refrigeration, and house heating—possibe only at rates lower than those hitherto available on most manufactured gas systems. Yet a fundamental consideration in revising rates downward is that net revenues must be protected. In his own company's situation it was essential to find a promotional rate plan which would leave the existing financial position undisturbed, and the low cost rate described below was the answer to the problem.—EDITOR.

By HARRY I. MILLER
Rate Engineer, Wisconsin Public Service Corporation, Oshkosh, Wisconsin

THE adoption of an electric low cost rate plan by our company last summer suggested to us the possibility of developing a similar plan for residential gas service.

Although there is a rather large number of electric utilities throughout the country having an objective rate scheme of some kind for electric service, there are so far as we know, only five gas companies outside of our own here in Wisconsin which have adopted some similar plan for gas service. These plans vary from "free gas" plans, "profit sharing plans," "service at cost" plans, to ours which provides a nominal charge for the increased use of service.

A low cost, or objective rate plan as it is sometimes called, is inherently a temporary means to an end. Without requiring a large immediate reduction in revenue, it permits customers to transfer from an existing rate schedule to a lower one if these customers will increase their use of service.* The duration of such a plan, of course, is dependent upon the time it takes to transfer the majority of customers to the lower level of rates. This depends to a large extent, upon the sales effort which the company puts forth and the receptivity of the customers to a fuller use of service.

Our gas plan consists of the customary three parts—the present standard rates, the low cost or objective rate (that is, the one to be attained when, as, and if), and a low rate for increased use by means of which customers may build up usage at a nominal charge,—until they reach the low cost rate.

We have different levels of rates for different communities, but let me take the Sheboygan rates as an illustration. The present standard rate is $1.35 per thousand for the first 5,000 cubic feet per month. That takes in 91 per cent of the residential business, but anyway the next 5,000 cubic feet can be purchased at only $1.20 per thousand—a whole 15c per thousand less than the first 5,000. Not much promotional in that you say? True, we admit it! Now, for our objective rate, we have adopted the following:

First 600 cu. ft. per month for $1.00 net.
Next 2,400 cu. ft. per month for $1.10 net per M.
Next 50,000 cu. ft. per month for 80c net per M.
Excess cu. ft. per month for 75c net per M.

That looks much better from a promotional standpoint. Nowhere is there an indication of any gas costing more than $1.10 (instead of $1.35) per thousand. And, after a use of 3,000 cubic feet, an 80c rate is available.

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* It meets the old argument by the customer that if rates were lower, customers would use more service, and the company's reply that if customers used more, the rates could be lower.

A. G. A. E. M. delegation to West Coast, left to right: I. W. Peffly, W. T. Rasch, Merrill N. Davis, C. W. Berghorn, C. W. Morley.

Officials of A. G. A. E. M. Meet with West Coast Manufacturers

TWO meetings were held in California last month to acquaint western manufacturers with the aims and functions of the new Association of Gas Appliance and Equipment Manufacturers. Called by W. J. Bailey of Day and Night Water Heater Co., Ltd., this year's chairman of the Pacific Coast Gas Association's Manufacturers' Section, the meetings gave opportunity for visiting A.G.A.E.M. officials to confer with groups in San Francisco on February 7 and in Los Angeles on February 11.

In the eastern delegation were W. T. Rasch of the American Gas Products Corp., president; Merrill N. Davis, S. R. Dresser Manufacturing Co., vice-president; I. W. Peffly of the American Stove Co., chairman of the domestic gas range division; J. P. Morley of Bastian-Morley Co., representing the gas water heater division, and C. W. Berghorn, executive secretary.

Opportunity was taken by P.C.G.A. Manufacturers' Section members at both meetings to pass a resolution urging the extension of Title 1 of the National Housing Act, "without modification or change." This section of the act, covering the Modernization Credit Plan, is due to expire April 1. In northern California alone appliance sales to the amount of $750,000 a month are being routed through this financing plan. Copies of the resolution were forwarded to western representatives and congressmen.

Mr. Rasch as official head of the A.G.A.E.M. reviewed the course of organization work among the gas appliance and equipment manufacturing industry, which has culminated in the new association. He explained the affiliation agreement between the A.G.A. and the A.G.A.E.M., under which members of the latter automatically become members of the AG.A. Manufacturers' Section. Members of the A.G.A. Manufacturers' Section may become members of the A.G.A.E.M., but do not have this status automatically through their A.G.A. affiliation

It was emphasized that the AG.A.E.M. has nothing to do with conduct of the A.G.A. Testing Laboratories program. This is regarded as strictly a utility company function, and nothing which would tend to commercialize the Laboratories will be undertaken by the manufacturers' group. No financial liability for maintaining the Laboratories is involved in A.G.A.E.M. membership. While generally understood, these points were stressed to clear up misunderstandings which might exist.

While some details of the affiliation between the A.G.A.E.M. and the A.G.A. are yet to be worked out, it is understood that dues paid the AG.A. by manufacturers will be credited against the amount which the A.G.A.E.M. has agreed to remit to the A.G.A. for services rendered

Membership in the AG.A.E.M. now stands at 155, Mr. Rasch stated, and represents at least 70 per cent of the industry on a production basis This excellent showing has been made in the short time since last October.

Indicating the lines along which the new association would serve, Mr. Rasch called attention to the three national sales campaigns on refrigerators, ranges, and water heaters which have already been shaped this year, in the formation of which the association has participated. Water heater manufacturer members have raised $100,000 toward their particular campaign, in which something over 210 utilities are already entered. Committees on legislation, and on national industrial relations, have also been appointed. The exhibit at the Atlantic City convention of the A.G.A. will be conducted by the A.G.A.E.M

Mr. Rasch stated that there were obvious differences between Pacific Coast manufacturing problems and those of manufacturers in other sections; these differences, however, do not extend to the broad national problems on which the association will center its services. He stated that the association directors were ready to listen to any proposal for coast manufacturer representation in the organization, either through individual or group membership.

Sentiment at both the San Francisco and Los Angeles meetings favored affiliation with the A.G.A.E.M. through membership in the P.C.G.A. Manufacturers' Section. The tentative proposal is that Pacific Coast manufacturers pay the dues formerly paid to the A.G.A. into the P.C.G.A. Manufacturers' Section, out of which $25 monthly (the present dues) would go to the P.C.G.A. Agreement would then be reached with the A.G.A.E.M. on the Coast's fair proportion of the association expense, and any balance would be divided among P.C.G.A. Manufacturers' Section divisions for special services necessary on the Coast.

Division heads of the P.C.G.A. Manufacturers' Section were authorized through action at both meetings to work out a plan along the above line, to be resubmitted to the membership of the Section, and if approved to go then to the A.G.A.E.M. for consideration. A nearly unanimous expression at both meetings favored cooperating in the A.G.A.E.M. program.

Following the presentation by Mr. Rasch, Messrs. Davis, Peffly, Morley and Berghorn were heard from in brief messages. The western group at both meetings expressed their appreciation of the A.G.A.E.M. delegation's visit, the eastern manufacturers having made the trip at their own expense in the interest of getting support for the national program.

Northern Natural to Lay 107-Mile Transmission Pipe Line

Northern Natural Gas Co., headquartering at Omaha, Neb., expects to let a contract for the construction of a 107-mile natural gas transmission pipe line on about March 1, according to information supplied to *Western Gas* by F. H. Brooks, vice-president and general manager. The line will extend from the gas fields at Hugoton, Kan., to Mullinville, Kan., where it will tie into the company's main 26-inch carrier.

The line is to consist of 20-inch electrically welded pipe and will cost some $2,200,000. Actual construction is scheduled to start about April 10.

WESTERN GAS welcomes the 80 new subscribers whose subscriptions start with the current issue. Distribution of this issue is 400 copies greater than that of one year ago.

More individual gas men buy WESTERN GAS than any other gas magazine.

Robinson Succeeds Tonkin as Peoples Natural President

JOHN B. Tonkin, president of Peoples' Natural Gas Co. and affiliated companies, announced his retirement from active duty at a dinner on January 31 at the Pittsburgh Athletic Association. The dinner was given as a testimonial to Mr. Tonkin's 42 years of service with various subsidiaries of the Standard Oil Co. of New Jersey and was attended by 275 employees from New York, West Virginia and Pennsylvania.

J. French Robinson, vice-president, is to succeed Mr. Tonkin as president of People's Natural Gas Co. and its affiliates. S. C. Preston, chief engineer of Peoples' Natural Gas Co., is to become vice-president of that company, and Christy Payne, Jr., of the same company, assistant to the vice-president.

Mr. Tonkin was born at Tidioute, Pa., in 1875. His father, the late Captain John Tonkin, was a pioneer in the oil and gas industry. Mr. Tonkin started in the gas business as a water boy on a pipeline construction job during his summer vacations. His first full-time job came in 1894 as a pipeline superintendent's clerk with the River Gas Co. at Marietta, Ohio. From this he advanced to the purchasing department of the National Transit Co. at Oil City, Pa.

JOHN TONKIN

J. F. ROBINSON

He came to Pittsburgh in 1902 to become treasurer of Hope Natural Gas Co., was elected vice-president and general manager of Peoples Natural Gas Co. in 1918 and became president of the company in 1933. At the same time he was made president of Columbia Natural Gas Co., Lycoming United Gas Corp. and affiliated companies, having been a vice-president of these companies since 1930. He is a former director and past president of the Pennsylvania Natural Gas Men's Association, and was for several years a director of the Natural Gas Association of America. He recently retired as chairman of the Natural Gas Department of the American Gas Association.

Mr. Robinson is said to be one of the youngest executives in the natural gas industry. He is a graduate of West Virginia University and holds an honorary degree of doctor of science from the University of Pittsburgh. He has been connected with Peoples Natural Gas Co. and affiliates for 15 years, acting as manager for the Lycoming United group of companies since 1930. He has been vice-president of Peoples Natural Gas Co. since 1933.

Mr. Preston is a graduate of Cornell University in mechanical engineering, and has been employed by Hope Natural Gas Co. and Peoples Natural Gas Co. since 1911. Since 1933 he has been chief engineer of Peoples Natural Gas Co.

Union Gas Co. Dawn Field-London Line Now in Service

THE two views above show phases of construction of the natural gas pipe line recently completed by the Union Gas Co. of Canada, Ltd., which headquarters at Chatham, Ontario. The line originates in the Dawn Field in Lambton County and runs to London, Ontario.

The pipe line route traverses rolling farm land, partially wooded, and negotiates four river crossings.

It consists of 52 miles of 10¾-inch O. D. steel pipe, 14 miles of 8⅝-inch, with miscellaneous amounts of 4½-inch. It is designed to operate at a working pressure of approximately 300 pounds, is Dresser-coupled, and is coated with Barrett products.

Photographs above are published through the courtesy of S. R. Dresser Manufacturing Co.

Coast Counties Again Makes "Free Gas" Offer

COAST Counties Gas and Electric Co., headquartering in Santa Cruz, Calif., is making a "free gas" offer to domestic consumers during the months of February and March. A similar campaign was conducted by the company in the early months of 1935 during which free gas was offered to commercial consumers as well as domestic.

The free gas offer consists of unlimited use of gas for all domestic purposes during the months of February and March, the consumers to be billed for these months in the amount of their January bills regardless of the amount used in excess of January. The bills for the two months of the campaign are stamped to indicate what the amount of the bills would have been without the free gas offer and to call attention to the rates applicable in the higher blocks. Newspaper advertising is used during the campaign, explaining the plan and special inducements are offered for the purchase of gas appliances.

Testing Laboratories Note New Trends in Water Heater Construction

FROM recent new gas water heater models submitted for approval to the A. G. A. Testing Laboratories, a trend toward low-demand heaters of rectangular, modern design is apparent. Among those submitted of late are a number of models of instantaneous units designed for small demands, which in the main are for single purpose applications, several being wall type. To minimize excessive condensation on long water coils, smaller coils are being used and the shortened length is being compensated for by using more fins and other heat absorbing surfaces. A few wall type instantaneous water heaters of ultra-modern design have been submitted which are suitable for large central system deliveries.

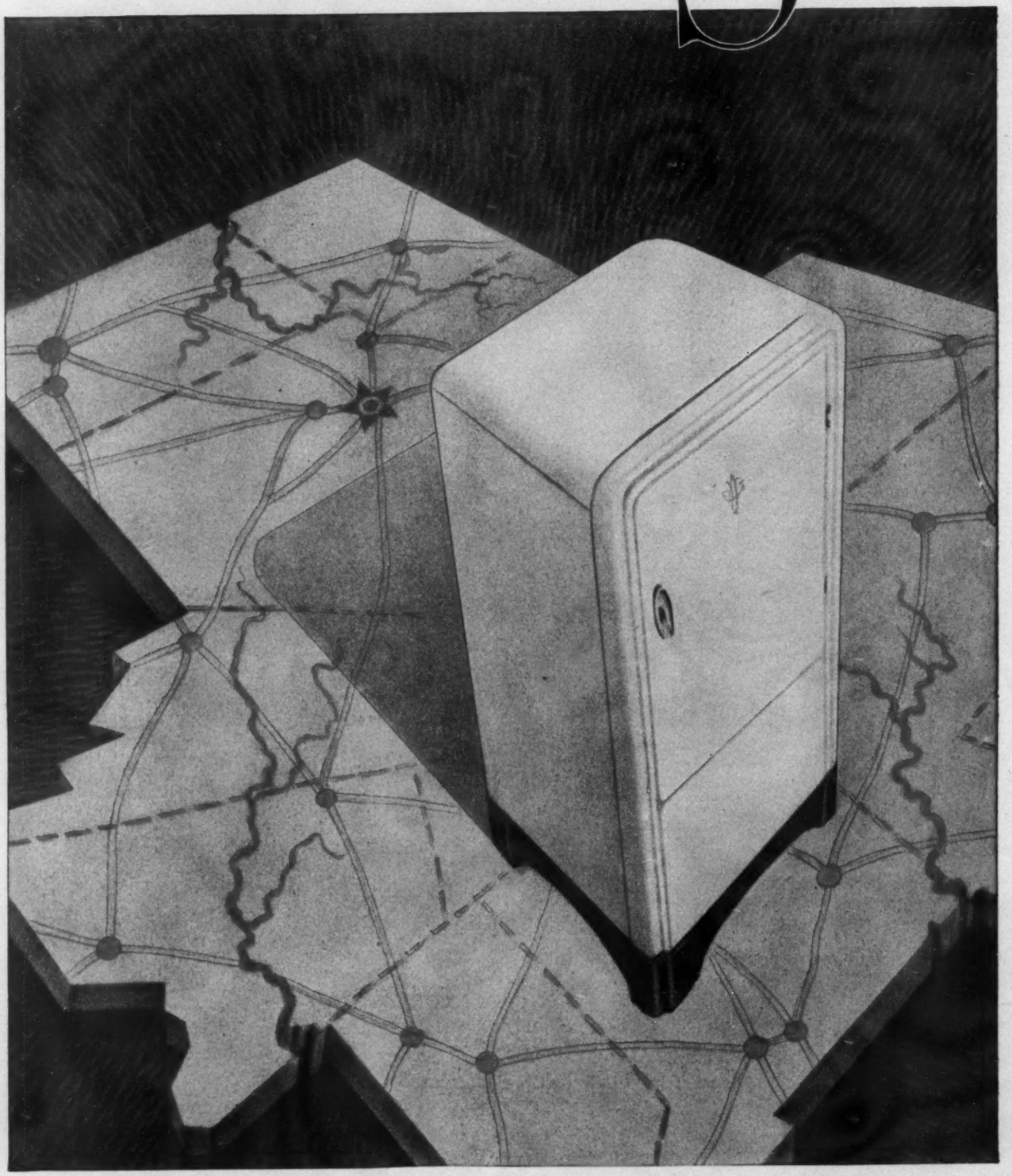
There is also a tendency toward the manufacture of multiple-rate water heaters with provision for adjusting to suit different customer output demand. All models must conform to the new standard requirements of 70 per cent thermal efficiency and of provision for water temperature and pressure limiting control.

Oklahoma Utilities Assn. Changes Name; Annual Meeting March 23

The name of Oklahoma Utilities Association has been changed to Oklahoma Gas and Electric Utilities Association, and its headquarters is now at 626 Biltmore, Oklahoma City.

The association will hold its annual meeting on the evening of March 23, with a dinner and dance, and a speaking program on which a number of prominent utility executives will appear. Among the speakers will be Judge S. I. McElhoes of the Southwestern Light and Power Co., Dr. F. R. Moulton of Chicago, Earl Hodges of the Cities Service Co., Frank P. Long of Oklahoma Natural Gas Co.; J. F. Owens of Oklahoma Gas and Electric Co., and Judge R. D. Garver of the Gas Service Co.

A 49th State



was added last year

totalling

2½ MILLION MCF

CONGRESS didn't debate its entrance into the Union. Newspapers didn't carry a word about it. Yet in 1935, so far as the gas industry was concerned, the equal of a new state the size of Nebraska or Washington was added to the nation's total gas consumption.

This 49th state was not the result of opening up new territory. Not a single penny of plant outlay or maintenance expense was required to supply gas to it. The whole new and valuable load which it contributed was added simply, permanently, by the installation of gas refrigerators.

During this single year, gas refrigeration increased the annual load of the gas companies of America by more than two and a half million MCF. And, increased load was only one—though vitally important—benefit which accrued to the gas industry through the sale of refrigerators.

Superior in performance and convenience to other types of automatic refrigerator, every gas refrigerator installed publicizes the modernity of gas as fuel . . . builds customer good-will for the gas company and the whole gas industry. It protects the cooking load, too, by helping to insure all-gas kitchens. And because of the satisfaction it gives, gas refrigeration creates new interest in other gas-using appliances.

This year offers *your* company a not-to-be-missed opportunity to win *more* homes to gas refrigeration. Take advantage of the ever-growing acceptance of gas refrigeration . . . take advantage of the big sales features of the new and finer Electrolux . . . to *March to Leadership with Gas Refrigeration* in your community during 1936! For our part, we offer fullest merchandising and sales cooperation—just write and tell us how we can help you. Servel, Inc., Electrolux Refrigerator Sales Division, Evansville, Ind.

New Air-Cooled **ELECTROLUX**
THE SERVEL *Gas Refrigerator*

Sales Totals Soar for San Joaquin Light and Power

SAN JOAQUIN Light and Power Co., which serves natural gas in Fresno and a number of other districts in San Joaquin Valley, Calif., during its last year's heating campaign, conducted from September 1 to December 31, sold 4,640 gas appliances, not including replacement ranges, according to information furnished *Western Gas* by Monty C. Pfyl of the sales department. This figure is composed of 1,557 ranges selling at an average retail price of $75; 694 water heaters, at $50; 348 radiant heaters, at $15; 563 floor furnaces, at $60; 1,221 circulating heaters at $50; 137 central furnaces, at $300; and 120 refrigerators at $250. Total approximate retail value of appliances sold was $317,065, exclusive of building heating and surplus gas equipment, representing 129,215 M c.f. of new load and 144 per cent of quota established for the drive.

These results were achieved by 13 salesmen in a field of 32,083 domestic meters, as of December 31, 1935. Total number of meters on the company's lines was 36,035, a gain of 1,900 meters since the close of 1934.

During October, second month of the campaign, the company offered to pay one-third of dealer advertising costs in certain specified newspapers and over certain radio stations. The rebate was applicable only on that portion of the newspaper advertisement which was devoted to gas automatic water heaters, floor furnaces, circulating heaters, or central furnaces; and in the case of radio advertising, the entire program had to be devoted to these appliances.

According to a schedule announced to dealers in advance, San Joaquin Light and Power ran advertisements in local papers throughout its area stressing the advantages of gas heating run over the signature "Your Appliance Dealer." These insertions occupied the dominant space on the page, and dealers were encouraged to spot their advertisements on the same page, so that full pages devoted to gas heating and appliances appeared periodically during the campaign. Billboard advertisements featuring natural gas appliances appeared in several of the principal towns in the area to reinforce these efforts.

Credit allowances to salesmen were alloted on the basis of estimated annual M c.f. load and estimated annual revenue. Credit allowance on central heating boilers was given on the basis of annual consumption, and on the product of the boiler rating in square feet by 22 cents for steam boilers, and by 14 cents for hot water boilers; conversion burners were computed on the basis of annual consumption and on the product of the boiler rating in square feet by 27 cents for steam boilers, and by 17 cents for hot water boilers.

For each month during the campaign a bonus of $10 was paid to the salesman selling the highest percentage of his campaign quota for the month. A $25 bonus was paid to the salesman exceeding quota by the greatest percentage for the entire campaign, $15 to the second ranking salesman and $10 to the third. Salesmen who failed to reach their quotas were not eligible for the final prizes.

Escondido Line Planned by San Diego Consolidated

SAN DIEGO Consolidated Gas and Electric Co. has an application on file with the California Railroad Commission to exercise a franchise for natural gas service at Escondido, Calif. The franchise will become effective early in March.

Service of natural gas to Escondido will involve construction of a 15-mile 3-inch high pressure line from a point 3 miles south of Oceanside to Escondido, bringing gas from the Southern Counties Gas Co. transmission line running south to San Diego. Work on the line will begin in April, subject to Railroad Commission approval of the franchise.

There are about 600 customers at Escondido, and changing over appliances, now adjusted for oil gas, will take place during the summer. Company personnel will be used entirely, as the work will be of short duration.

An auxiliary butane-air plant, formerly located at Oceanside, will be moved to Escondido to serve as stand-by. At Oceanside the plant was used as stand-by at the time when this town was served with manufactured gas from San Diego. The Oceanside oil gas plant, which has not been in use for several years, is being dismantled at the present time.

Odorless Gas Log Developed by Los Angeles Firm

COLONIAL SHOPS, Los Angeles, has placed on the market a recently developed A. G. A. approved odorless gas log known as Glo-Fire. The Glo-Fire unit consists of a bank of three logs made of a highly refractory ceramic material and closely resembles oak logs.

A new departure in gas log design is embodied in that combustion takes place within the logs, completely out of sight except where an incandescence appears between the two front logs. The lower front log, which is the largest, constitutes the combustion chamber, the front wall of which is imperforate, relatively thin and of high heat conductivity. The rear wall is relatively thick and of low heat conductivity. An aspirating burner in the lower portion of the chamber supplies a mixture of gas and primary air sufficient for partial combustion. Secondary air for completing combustion is admitted to the chamber from below the rear wall, passing between the burning gas issuing from the burner and the rear wall, so that the secondary air is preheated within the chamber before admixture with the burning gases. This admixture takes place in the upper portion of the chamber which is vented at the top for the discharge of the products of combustion. As the final stage of the combustion takes place, the upper front of the chamber is heated to an incandescent glow and causes the same effect on superimposed logs above the vent.

In the process of manufacture Glo-Fire logs are kiln-fired to a temperature three times as high as that when the heater is in operation.

The patented method of introducing and preheating the secondary air maintains an oxidizing atmosphere throughout the combustion area, preventing the depositing of carbon in or upon the chamber walls.

Breakfast in 6 Minutes!

(Continued from Page 11)

grounds for dissatisfaction on this count. Stop watches were used for timing.

In Nashville the contest finals were broadcast over one of the local radio stations, with such good effect that the state finals were also broadcast. This feature was a fine interest-builder, with many evidences that the broadcasts were widely heard. There was a good element of humor in these broadcasts. The typical announcement first covered contest details briefly, then started the entrants off with the word "GO," and thereafter ran something as follows:

"They're off . . . they're placing the pans in their proper places . . . Mrs. Jones is filling her coffee-maker with water . . . Mrs. Smith is closely following her . . . they're neck and neck . . . both are un-wrapping their bacon . . . listen to the speed of those eggs being cracked and placed in the skillets . . . Mrs. Smith is doing everything at once, mixing eggs with her left hand, turning the bacon with her right, closing the oven with her knee, watching the coffee with her eyes, and generally speaking, doing everything except sweep the floor . . . ."

And so on until the first to complete the meal had looked at the time keeper and given the word, "Finished!"

In the opinions of those conducting the above contest, the event definitely proved *speed,* and created more general interest than any cooking school or function of the same general nature that had ever been attempted before. For a competitive territory where gas for cooking is being subjected to the heaviest sort of electric broadsides, the value of the contest is unquestionable, and it should have merit in most localities where the competition is only normal.

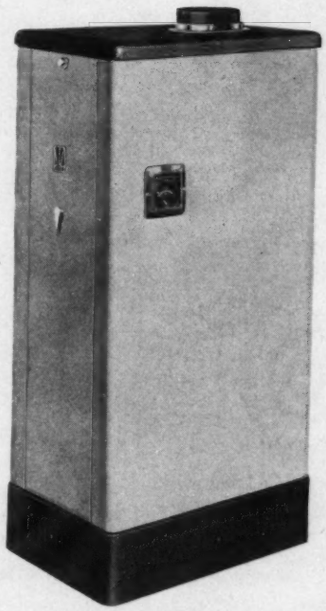
One subtle tribute to the appropriateness of "Breakfast in 6 Minutes" as a key slogan came from a Nashville laundry, which published an advertisement headed "Washing's Done in 6 Minutes," while contest interest was at its height.

Mr. Leverette, who was instrumental in staging the contest, last month described it on the program of the Southern Gas Association and Southern-Southwest Regional Gas Sales Conference at New Orleans, and by way of illustration, two demonstration breakfasts were cooked simultaneously for the benefit of the delegates—one by a New Orleans Public Service home service demonstrator, and one by a Nashville Gas Co. salesman.

TWO GREAT NEW GAS UNITS

for Building Load

Here are two logical answers to the load-building question. Mueller's new Gas-Fired Boiler for small homes comes into the market at a time when new home building and modernization are hitting a rapid stride.



New Mueller Gas Era Boiler

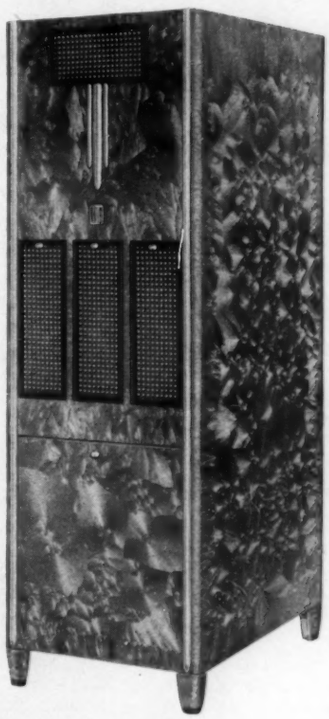
Adaptable to steam, hot water or vapor heating. The new Series "A" (54 inches high and 28 inches deep) are ideally suited to small home heating. They are also adaptable to any system of heating or air conditioning employing radiation, convectors, pipe coils, unit heaters or blast heating surfaces. Go after this profitable gas load. Get all the facts about these remarkable new Mueller Boilers. Write at once.

All signs point to a decided swing to **designed gas equipment** and Mueller is ready with a complete line of Gas-Era Boilers and Furnaces to meet every requirement.

Muelleraire Opens New Market Among Stores

Great new opportunities for selling gas heat to stores, showrooms, small factories, garages, etc., are opened with Mueller's new, portable, gas-fired Muelleraire.

Frequently the load you get with the Muelleraire is located close to existing gas supply. It costs little or nothing to connect it. Read about this wonderful revolutionary device. Then go after this load now. Write for booklet W-G-3. Address L. J. Mueller Furnace Co., Milwaukee, Wisconsin, also manufacturers of the popular Gas Era Furnaces—both steel and deluxe cast iron.



New Muelleraire Unit Heater

This portable gas-fired air conditioning unit heats, filters, humidifies the air and distributes it by forced circulation. Every store, showroom, small factory in your community is a prospect. Count them over. Figure the profitable load that can be built by merchandising this popular and revolutionary gas heater. Get all the facts today.

MUELLER • MILWAUKEE

L. J. MUELLER FURNACE CO. MILWAUKEE, WIS.

4th Nation-Wide Refrigeration Drive Begins in April

B. H. Gardner inspects the "Sword of Merit," trophy in the forthcoming refrigeration campaign

THIS year's refrigeration campaign will be the fourth nation-wide gas-operated refrigerator drive sponsored by the American Gas Association Refrigeration Committee, and will last through April, May and June. It will be known as the "Leadership Campaign", with a gold-hilted "Sword of Merit" as its symbol.

Prize awards to individual companies are to be larger than ever before and cash awards to salesmen will be about double those of last year. Eight Swords of Merit will be presented to the eight companies who make the highest records in their respective divisions. More than 1,000 awards, including $24,320 in cash, constitute the stake. Company salesmen will be awarded a total of $12,320; $7,200, comprising 720 awards, will go to high retail salesmen during each month of the campaign; $5,120 will go to retail salesmen making the highest records during the entire campaign. Gold "medals of merit" will be presented to all salesmen who make the best showing during the drive. In addition to the eight swords for the highest ranking companies, 60 cash awards amounting to $12,000 will be presented, and a cash prize goes with each sword. Companies in the first, second and third divisions making the most installations per 10,000 meters will receive additional cash awards.

Last year's campaign achieved a registration of nine million meters, and this year's has ten million for its objective. In the Leadership Campaign competing companies will be divided into eight groups. Two divisions will be composed of companies competing among themselves on the basis of percentage of increased installations during the 1935 campaign. The first division will consist of seven metropolitan gas companies, the second, of six companies that made outstanding showings in Division B of the 1935 campaign.

Six divisions will be made up of all remaining companies grouped according to the number of domestic meters on their lines, and will compete on the basis of total installations for the drive. These divisions are the third division, companies having over 40,000 meters; fourth division, 20,001 to 40,000 meters; fifth division, 10,001 to 20,000; sixth division, 5,001 to 10,000; seventh division, 1,001 to 5,000; and eighth division, 1,000 meters or less.

For the first time, home service departments of gas companies will participate in the awards, $50 in cash going to the home service department of each company that wins a Sword of Merit or that wins first place on installations per 10,000 meters.

As in previous campaigns, the awards are based on installations of Electrolux refrigerators, the contest having been planned by the Committee in collaboration with the Electrolux Refrigerator Sales Division of Servel, Inc. In working out the details of the campaign, the Committee had the assistance of H. S. Boyle, promotion manager of Servel, Inc., the aim of the Committee having been to have the campaign tie in with the promotional and advertising program of the Electrolux company, the largest in its history.

Members of the 1936 A. G. A. Refrigeration Committee are as follows: B. H. Gardner, Columbia System, Columbus, Ohio, chairman; F. C. Armbruster, Middle West Corp.,, Chicago, Ill.; E. J. Boyer, Minneapolis (Minn.) Gas Light Co.; James F. Orr, Central Illinois Public Service Co., Springfield, Ill.; John J. Quinn, Boston (Mass.) Consolidated Gas Co.; George L. Roach, Servel, Inc., Evansville, Ind.; E. C. Weston, Pennsylvania Electric Corp., Terre Haute, Ind.; and John W. West, Jr., secretary.

A. G. A. Natural Gas Meeting Program Taking Form

ARRANGEMENTS for the ninth annual meeting of the Natural Gas Department of the American Gas Association, which will convene at Dallas, Texas, May 5 to 8, 1936, are beginning to take final form.

William Moeller, Jr., chairman of the department, was in Dallas several days during the week of February 3, conferring with the convention committee members and A. E. Higgins, secretary of the department, who has headquarters in Dallas. It is expected that the program will be completed in the early part of March.

General convention arrangements will be in the hands of a committee composed of R. G. Soper, General Chairman; L. B. Denning, Jr., Transportation; C. K. Patton, Reception and Attendance; Geo. Martin, Program Arrangements; B. R. Newberry, Entertainment; W. C. Grant, Publicity.

The Lone Star Gas Co. will serve as the host company and all the members of the convention committee are Lone Star men.

The Adolphus and Baker Hotels have been designated as headquarters hotels. General sessions and the annual banquet will be held at the Baker Hotel, and the parallel sessions and committee meetings will be held at the Adolphus Hotel.

James L. Stone Elected President Spokane Gas & Fuel Co.

JAMES L. STONE, vice-president and general manager of the Spokane (Wash.) Gas & Fuel Co., has been elected president of the company and will continue as general manager.

JAMES L. STONE

Mr. Stone first entered the gas industry in 1905 at Denver, serving variously as collection clerk, bookkeeper, contract clerk and salesman. In 1913 he became salesman for the Toledo Edison Co., and in April of the year following was transferred to Mansfield, Ohio, as new business manager of the Ohio Public Service Co. He was next transferred to Salina, Kan., in November, 1919, as vice-president and general manager of the Salina Light and Power Co. In May, 1921, he became vice-president and general manager of the Ohio Public Service Co. at Alliance, Ohio.

Mr. Stone came to Spokane in November, 1923, as vice-president and general manager of the Spokane Gas & Fuel Co. He has had an active part in Pacific Coast Gas Association affairs, serving as president of the organization in 1932.

Mills Elected President of Kansas and Missouri Properties

Geo. A. Mills, formerly field executive for the Middle West Utilities Co. and president of the Michigan Gas and Electric Co., was elected president of the Kansas Electric Power Co., Lawrence, Kan., on January 6 and was elected president of the Missouri Gas and Electric Service Co., Lexington, Mo., on January 11. In both cases Mr. Mills succeeds C. W. Amidon, who passed away November 25.

During the past 20 years Mr. Mills has been associated with utility properties, first in Winnipeg, Canada, then with the Wisconsin Division of the Northern States Power Co. at Eau Claire, the Kewanee (Ill.) Public Service Co. and with the Central and Southwest Utilities Co. at Dallas. He became field executive with the Middle West Utilities Co. about two years ago.

Portland, Ore., 1935 Business Up

Portland (Ore.) Gas & Coke Co. had a 12 per cent increase for 1935 in volume of gas sold over that for 1934, according to the report of Paul B. McKee, president. Operating revenues were up $174,293 over the previous year. This gain, however, was offset by a $262,451 increase in operating expenses, $115,522 of which went for 1935 intensive new business promotion activities. Appliance sales for the year are estimated to have added $175,000 in annual operating revenue.

So Mrs. Modern buys a MAGIC CHEF GAS RANGE

● Today, Mrs. Modern buys a gas range pretty much as she does a motor car. She replaces her old range when there are still many meals left in it just as she replaces her outmoded car when there are still many miles left in it.

She buys a new range because she wants the new style, new beauty, new convenience and all the advanced features that only a modern gas range can give her.

In Magic Chef Series 1400, gas companies and dealers have found the modern gas range that completely satisfies Mrs. Modern's buying urge. Back of its advanced style and up-to-the-minute efficiency is an extensive and sustained national advertising campaign to help him develop his gas range business to utmost strength against the competition of other fuels. Through this advertising and the selling power of the complete Magic Chef line, American Stove Company offers needed and practical co-operation in protecting the gas cooking load.

AMERICAN STOVE COMPANY
BOSTON • NEW YORK • ATLANTA • CLEVELAND • CHICAGO
ST. LOUIS • PHILADELPHIA • SAN FRANCISCO • LOS ANGELES

Magic Chef
AMERICAN STOVE COMPANY

LOOK FOR THE RED WHEEL WHEN YOU BUY A MAGIC CHEF

Stage setting and puppets used by the P. G. and E. East Bay Division in presenting a dramatization of its 1936 sales promotion program.

Puppet Show Dramatizes P. G. and E. Sales Story

A novel presentation of the 1936 sales promotion story was made by the East Bay Division of Pacific Gas and Electric Co. in the several towns which it serves on the east side of San Francisco Bay. Puppets were used to dramatize a story of sales opportunities and promotional activities engaged in by the company for its gas and electric appliance dealers and company employees.

A large book, 4 by 5 feet, entitled "Gas and Electricity—The Best Sellers for 1936," served as background for the puppet stage setting, and the fourteen pages revealed during the progress of the show told the promotional story by statistical charts and graphs.

A puppet in evening dress acting as master of ceremonies introduced members of the cast: Mrs. Annie Customer, a housewife; Mr. Hunter, P. G. and E. sales service representative; Ray Haberdasher, proprietor of the haberdashery store; Mr. Graham Industrialist; Mr. Ed. Electrical Contractor, and Kilowatt, the dog.

The puppet master of ceremonies gave the welcoming address, and as he turned the pages, explained the various statistical charts, gave highlights on the customer interest in appliances through sales service survey, results of the dealer appliance activities in 1935, market analysis for 1936 and the cooperative selling program of the company utilizing advertising, prospects, campaigns and dealer organizations. Lightened throughout by engaging bits of humor, the presentation was at once instructive and entertaining.

L. F. Galbraith is East Bay Division sales manager and directed the presentation of the 1936 sales program in the division. Perry Dilley, head of the University of California School of puppetry, operated the show. Members of the East Bay sales department developed the idea and wrote the script.

Southern Gas Assn. Officers Elected at New Orleans

WITH hospitable New Orleans as a background, the Mardi Gras about to get under way, and a fine business program arranged, the Southern Gas Association found no difficulty in getting a crowd out for its joint meeting with the Southern-Southwestern Regional Gas Sales Conference last month. Dates were February 19 to 22 inclusive and headquarters were at the Roosevelt Hotel.

General sessions held mornings of the first three days, with sales conference meetings during the afternoons of the same days, and a home service program on the final day, plus a technical session and an industrial forum, made up a well rounded program for the more than 250 who were present at New Orleans.

Elections of the Southern Gas Association brought the following into office for the new year:

President—H. E. Meade, New Orleans Public Service, Inc., New Orleans.

First Vice-President—Chester May, Community Natural Gas Co., Dallas, Texas.

Second Vice-President—H. G. Bonner, Knoxville Gas Co., Knoxville, Tenn.

Secretary-Treasurer—S. L. Drumm, New Orleans Public Service, Inc., New Orleans.

Directors: C. B. Wilson, Little Rock Gas and Fuel Co., Little Rock, Ark.; W. A. Hudson, Birmingham Gas Co., Birmingham, Ala.; W. E. Derwent, Geo. D. Roper Corp., Rockford, Ill.; John C. Dyer, Ruud Manufacturing Co., Jacksonville, Fla.; W. A. McInnis, Memphis Power & Light Co., Memphis, Tenn.; E. B. Ballinger, American Stove Co., St. Louis, Mo.; C. K. Patton, Dallas Gas Co., Dallas, Texas, and C. F. Carter, Nashville Gas & Heating Co., Nashville, Tenn.

The very complete printed program prepared for the meetings included a story of Mardi Gras and some interesting background on the City of New Orleans for the benefit of delegates. Gas service is winding up its 100th year in New Orleans, and some of the industry's local highlights were also presented in the program pamphlet.

C. B. Gamble of Birmingham, who headed the S. G. A. this past year, presided over the general sessions, with C. B. Wilson of Little Rock conducting the sales conference meetings as chairman of the committee in charge. Albertine Berry, Dallas, directed the home service meeting, while Henry S. Jones of Memphis conducted the technical session. J. M. Clann of New Orleans was in charge of the industrial and commercial forum. Jay C. Barnes of the New Orleans host company was head of the entertainment committee.

Western Gas for April will review a number of the New Orleans program papers in detail.

Varied Program Due for Members of Missouri Association

THE 1936 annual convention of the Missouri Association of Public Utilities will be held April 29, 30, and May 1 in St. Louis, Mo., at Hotel Jefferson, according to Jesse Blythe, assistant secretary of the Association. C. E. Michel, Union Electric Light & Power Co., St. Louis, is president.

Among the speakers will be L. B. Denning, president of the American Gas Association; Alex Dow, president of the Detroit (Mich.) Edison Co.; D. W. Snyder, Jr., Jefferson City, Mo., president of the Missouri Power & Light Co.; G. S. Howland, Chicago, general manager of Electric Shops, Commonwealth Edison Co.; H. T. East, Chicago, Public Service Co. of Northern Illinois; W. Scott Johnson, St. Louis, Mo., sanitary engineer, St. Louis Department of Health; E. P. Gosling, St. Louis, Mo., president, Laclede Gas Light Co.; Louis H. Egan, St. Louis, Mo., president, Union Electric Light & Power Co.; J. M. Strike, St. Joseph, Mo., St. Joseph Railway, Light, Heat & Power Co.

An employees' public speaking contest will be held on the evening of April 29 for employees of member companies. There will be separate contests for men and for women. The subject for men is "The Utility's Part in the Growth and Development of the Community," and for women, "The American Home—How the Utilities Help Build It." Fred Karr, of the Gas Service Co. at St. Joseph, is chairman of the speaking contest committee.

A Safety Meeting on the afternoon of April 29 will open the convention. J. M. Strike, chairman of the Accident Prevention Committee, will preside.

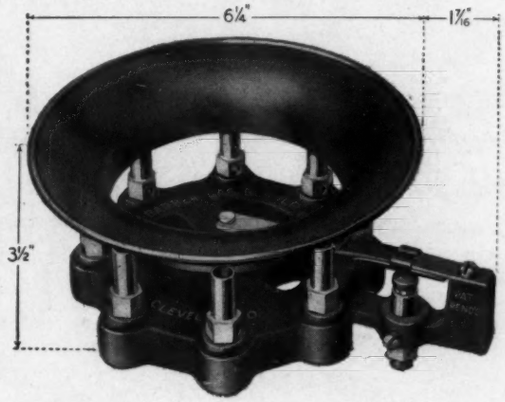
The Program Committee in charge of completing the program is composed of Dudley Sanford, Webster Groves, Mo., St. Louis County Gas Co., chairman; C. J. Prashaw, Jefferson City, Mo., Missouri Power & Light Co.; L. W. Helmreich, Jefferson City, Mo., Capital City Water Co.; R. D. Lewis, St. Louis, Mo, Laclede Gas Light Co.; H. E. Scheark, Kansas City, Mo., Kansas City Power & Light Co.; R. L. Shuck, Springfield, Mo., Springfield Gas & Electric Co.

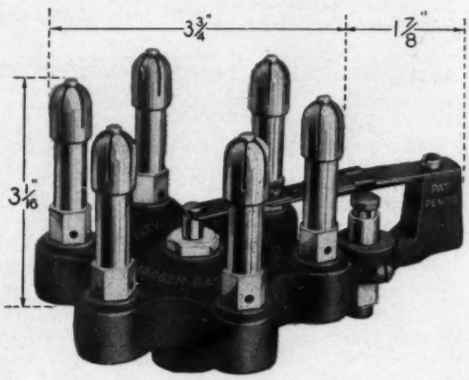
Chain Store Tax Hits Merchandising

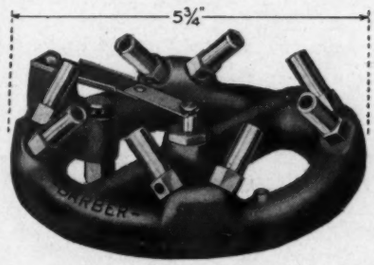
Community Natural Gas Co., headquartering in Dallas, Texas, has discontinued its district merchandising activities in Texas as the result of the passage of the chain store tax (House Bill No. 18) at the first called session of the 44th Legislature of the State of Texas. Merchandise stores at 10 district headquarters, merchandise displays at six sub-district offices and at dealer stores have been discontinued and 73 dealer contracts have been cancelled.

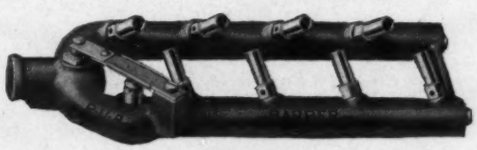
THE NEW LOW PRICES OF BARBER BURNERS

WILL AID YOUR APPLIANCE SALES









Barber Burners are especially adaptable to Banana Room Heaters, Circulating Heaters, Clothes Dryers, Coffee Roasters, Coffee Urns, Cone Machines, Floor Furnaces, Pop Corn Machines, Garage Heaters, Gas Hair Dryers, Laundry Stoves, Space Heaters, Steam Tables, Sterilizers, Vulcanizers, Warming Ovens, Water Heaters and numerous other appliances.

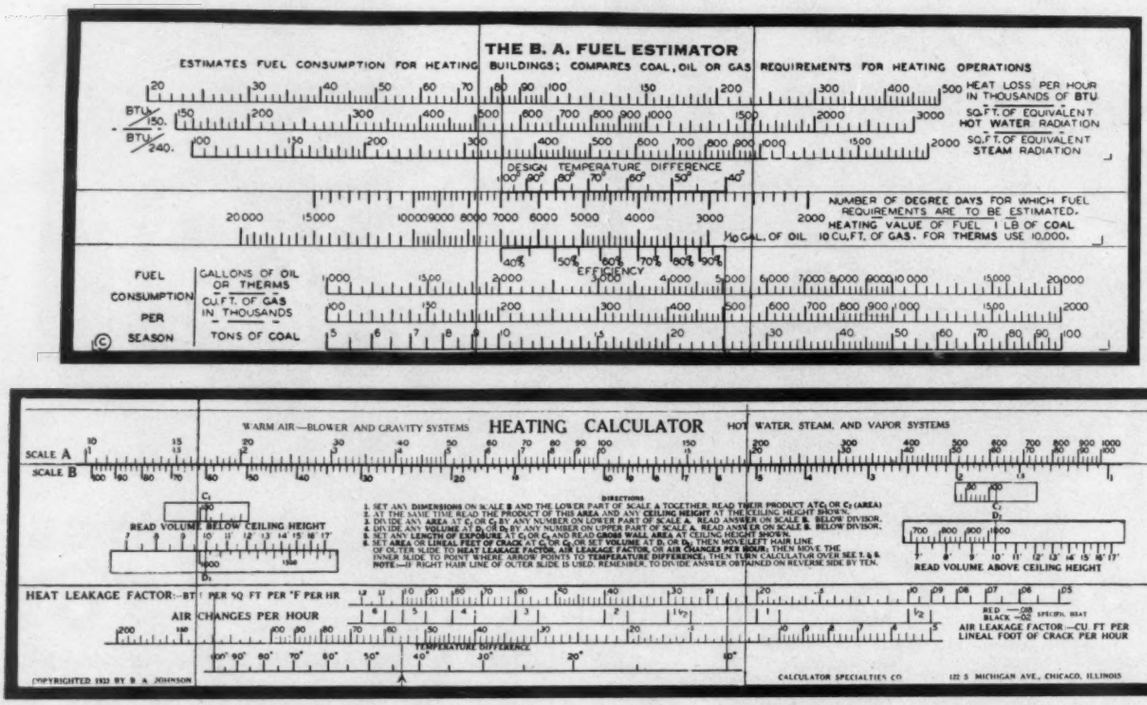
•

Our Engineering Department will gladly cooperate with you in specifying the proper Barber Burner equipment for your needs.

THE BARBER GAS BURNER CO.

3702-4 Superior Ave. - - - Cleveland, Ohio

Southern California Distributors-Talbot & Clark-912 E. 3rd St., Los Angeles


THE B. A. FUEL ESTIMATOR
ESTIMATES FUEL CONSUMPTION FOR HEATING BUILDINGS; COMPARES COAL, OIL OR GAS REQUIREMENTS FOR HEATING OPERATIONS
HEAT LOSS PER HOUR IN THOUSANDS OF BTU
SQ. FT. OF EQUIVALENT HOT WATER RADIATION
SQ. FT. OF EQUIVALENT STEAM RADIATION
DESIGN TEMPERATURE DIFFERENCE
NUMBER OF DEGREE DAYS FOR WHICH FUEL REQUIREMENTS ARE TO BE ESTIMATED.
HEATING VALUE OF FUEL 1 LB. OF COAL 1/10 GAL. OF OIL 10 CU. FT. OF GAS. FOR THERMS USE 10,000.
EFFICIENCY
FUEL CONSUMPTION PER SEASON
GALLONS OF OIL OR THERMS
CU. FT. OF GAS IN THOUSANDS
TONS OF COAL
© 1935 B. A. JOHNSON

HEATING CALCULATOR
WARM AIR—BLOWER AND GRAVITY SYSTEMS
HOT WATER, STEAM, AND VAPOR SYSTEMS
SCALE A
SCALE B
READ VOLUME BELOW CEILING HEIGHT
READ VOLUME ABOVE CEILING HEIGHT
DIRECTIONS
HEAT LEAKAGE FACTOR:—BTU PER SQ FT PER °F PER HR
AIR CHANGES PER HOUR
TEMPERATURE DIFFERENCE
AIR LEAKAGE FACTOR—CU FT PER LINEAL FOOT OF CRACK PER HOUR
COPYRIGHTED 1933 BY B. A. JOHNSON
CALCULATOR SPECIALTIES CO
122 S. MICHIGAN AVE., CHICAGO, ILLINOIS

Slide Rule Devices for Rapid Calculation of Heating Requirements

THE Calculator Specialties Co., Chicago, is offering a new and interesting device for heating men, which is known as the B. A. Fuel Estimator. This device is a simple slide rule combination for easy estimation of fuel consumption for heating of any building, whether the fuel be gas, oil or coal. It also can be used to compare coal, oil and gas requirements for any heating operation. The device makes it easy to combine the fundamental variables of calculations without the necessity of remembering formulae or constants.

The B. A. Fuel Estimator was developed by B. A. Johnson, staff engineer in the Space Heating Division of the Peoples Gas Light and Coke Co., after considerable field work had indicated that it would be useful for quick and accurate figuring. It is now a companion to the Calculator Specialties Co.'s Heating Calculator which has been on the market for some time and is gaining acceptance because of its usefulness, particularly in warm air duct layout calculations.

The B. A. Fuel Estimator is sold exclusively by the Calculator Specialties Co., 122 S. Michigan Ave., Chicago.

Mid-West Corp. Operating Executives Hold Annual Meeting

THE annual meeting of executives and commercial managers of operating properties of the Mid-West Corp., of Chicago, was held in the headquarters office of the company February 12 through 14. One hundred executives of the company attended sessions during the three days.

Problems pertaining to gas, power and light were dealt with at the conference with the following papers being read on gas subjects:

"Load Building Results 1935," Fred Armbruster, supervisor gas utilties, Middle West Service Co.; "Industrial Gas House Heating and Air Conditioning Progress for 1935," Henry O. Loebell, new business manager, Natural Gas Pipeline Co. of America; "Load Building After Conversion from Manufactured to Natural Gas," C. L. Sandstedt, secy-treas. Northwest Public Service Co., Huron, S. D.; "Load Building on Natural Gas Properties," James F. Orr, vice-president, Central Illinois Public Service Co., Springfield, Ill.; "Promotion of Automatic Water Heater Sales on Manufactured Gas Properties," George Donald, general superintendent, Michigan Gas and Electric Co, Ashland, Wis.; "Potential Load Possibilities on Present Manufactured Gas Facilities," F. W. Hainer, supervisor of gas utilities, Wisconsin Power & Light Co., Madison, Wis.

Engineers Discuss Gas Applications in Lime Burning and Glass Industry

The Gas Engineers Section of Western Society of Engineers, which meets each month in the Chicago headquarters of the organization, featured discussions on "Burning Lime with Gas Fuel" and the "Application of Gas in the Glass Industry" at its meeting held on February 7.

Joseph Kahn of the Industrial Department, of Peoples Gas Light & Coke Co., led the discussion on burning lime, with C. F. Henness, manager of gas sales of Public Service Co. of Northern Illinois, describing his company's installations in the glass industry. Hugh E. Ferguson, plant testing engineer of the Peoples Gas Light & Coke Co., is chairman of the section. The next meeting of the section will be held March 9th.

Eccles Transferred to Tucumcari

Harold Eccles, manager of the Gas Co. of New Mexico office at Portales, has been transferred to Tucumcari, succeeding B. D. Wallace who resigned.

Portland Gas & Coke Sales Department Advancements

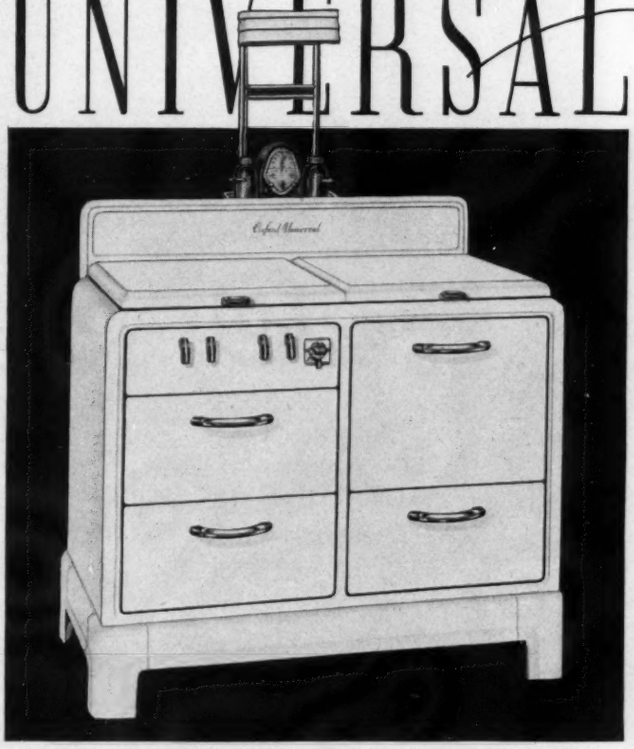
Joe D. Ingram, manager of residential sales, Portland (Ore.) Gas & Coke Co., was promoted to the position of assistant to the commercial manager on January 10, according to announcement made by B. H. Parkinson, commercial manager. Thomas H. Bailey, a sales supervisor, was made manager of residential sales.

David H. Gowans, Jr., territorial representative in Oregon City, was named agent for the Albany-Corvallis territory. John H. Small, salesman at Oregon City, was advanced to the position of territorial representative.

Glencoe Grants Natural Gas Franchise

The Union Gas Co. of Canada Ltd., Chatham, Ontario, was granted a franchise in January to serve natural gas in the town of Glencoe, Ontario. Glencoe has a population of about 1,000 inhabitants and lies within a mile of the company's new 10-inch transmission line from the Dawn Field to London. The franchise calls for construction to begin within 18 months from date of granting of the franchise.

UNIVERSAL *Modernizes*



THE GAS SERVICE

The Simmer-Save Burner, with its controlled boiling heat, makes possible Simmer-Save Cookery—a more modern, simple, certain and vastly improved method of top burner cooking. The steps in Simmer-Save Cookery are simplicity itself. There is nothing for the Homemaker to learn anew.

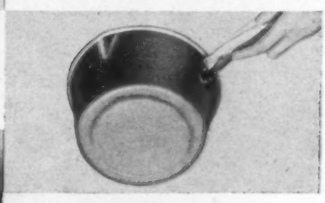
The covered vessel is placed over the Simmer-Save Burner and the burner turned to fast heat in order to bring water to boiling point in shortest space of time.

When water has reached boiling point, burner is turned to Simmer-Save section, it will then maintain a gentle boiling action until food is cooked.

No special type of cooking utensil is required with Simmer-Save Cookery. The ordinary cooking pan will give equally as satisfactory results as the most expensive cooking vessel.

With Simmer-Save Cookery only a small amount of water is used. The Simmer-Save Burner also makes possible waterless cooking.

The Simmer-Save Burner with its controlled boiling heat does not rapidly evaporate the water. After the cooking was completed, nearly as much liquid remained as was originally put in cooking utensil.



Simmer-Save Cookery is clean and labor-saving—it does not blacken pots and pans. *Note:* The bottom of the utensil used for cooking the vegetables was free from soot and just as clean as when the cooking started.

● Universal presents to the gas utility industry a gas range that elevates cooking to its highest plane of convenience and modernity. In all divisions of cookery—Top Burner, Broiling, and Oven—the Universal introduces new and higher standards of cooking performance.

The Universal is designed and engineered with the two-fold purpose of enabling gas utility companies to modernize the domestic gas cooking service and to adequately combat electric competition.

The installation of Universal Gas Ranges on the mains of any gas company is insurance against possible inroads on the domestic gas cooking load, as Universal brings to the consumer a new conception of the merits of gas as a cooking fuel plus a new freedom from the objectionable elements of cooking which were formerly the common lot of the "Lady Who Cooks." In brief, it creates satisfied gas consumers.

Universal—from the standpoint of the range itself—the organization—and its sales promotional helps—is ideally equipped to cooperate with gas utility companies in promoting the sale of truly modern gas ranges.

UNIVERSAL *Gas Ranges*

MANUFACTURED BY CRIBBEN & SEXTON COMPANY, 700 N. SACRAMENTO BLVD., CHICAGO, ILLINOIS

Mid-West Gas Association 31st Convention Plans Set

THE 31st annual convention of the Mid-West Gas Association is to be held at the Radisson Hotel, Minneapolis, Minn., April 13 to 15. According to the program supplied *Western Gas* by R. B. Searing, secretary-treasurer of the Association, the following papers will be presented:

Address — Hugh S. Magill, president, American Federation of Investors Inc., Chicago, Ill.

Selling Hot Water Service—H. N. Ramsey, president, Welsbach Co., Gloucester City, N. J.

Load Building by Water Heating—F. C. Armbruster, Middlewest Utilities Co., Chicago, Ill.

Commercial Gas Equipment—C. H. French, Standard Gas Equipment Corp., New York, N. Y.

Servicing of Restaurant and Hotel Gas Equipment—C. F. A. Schuldt, Northern States Power Co., St. Paul, Minn.

Househeating—J. E. Swenson, Minneapolis Gas Light Co., Minneapolis, Minn.

Regulating Equipment for Gas Fired Furnaces — A. C. Grant, commercial engineer, Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Chimneys: Past, Present, and Future—Robert L. Klar, Des Moines Gas Co., Des Moines, Iowa.

The Association of Gas Appliance and Equipment Manufacturers and Its Relation to the Gas Industry — George E. Frazer, Frazer & Torbet, Certified Public Accountants, Chicago, Ill.

Tomorrow for the Gas Industry—Major Alexander Forward, managing director, American Gas Association, New York, N. Y.

Gas Refrigeration Load—E. Voneman, Montana-Dakota Power Co., Minneapolis, Minn.

Gas Sales vs. Electric Sales—E. C. Sorby, sales promotion manager, Geo. D. Roper Corp., Rockford, Ill.

Servicing of Customers' Appliances—C. D. Robison, Metropolitan Utilities District, Omaha, Neb.

Reports of American Gas Association affiliation representatives also will be presented, including the following: *Commercial Section*—Stanley Taber, Iowa-Nebraska Light & Power Co., Lincoln, Neb. *Accounting Section*—H. C. Holder, Council Bluffs Gas Co., Council Bluffs, Iowa. *Technical Section*—L. J. Eck, Minneapolis Gas Light Co., Minneapolis, Minn. *Manufacturers' Section*—C. S. Hoyt, Minneapolis-Honeywell Regulator Co., Minneapolis, Minn. *Industrial Section*—Amos H. Abbott, Northern States Power Co., Minneapolis, Minn.

Moody Heads New Arizona Natural Gas Co.

The new gas company which is laying natural gas distribution systems in the towns of Superior and Coolidge in Arizona, has been incorporated as the Natural Gas Service Co. of Arizona, and headquarters at Superior. Marshall A. Moody, who was formerly president of the Superior Light and Power Co., is president of the new company. J. B. Shea, formerly of the Southern California Edison Co. and more recently of the Arizona Edison Co., is vice-president and general manager. Stanley Germane, Phoenix attorney, is secretary-treasurer.

The rate for the two towns provides for a minimum monthly charge of $2 for the first 200 cu. ft. and 59 cents per M c. f. in excess of 200 cu. ft. Negotiations are in progress for a distribution system in Florence which is about 4½ miles from the Western Gas Co. carrier that runs to Superior.

Mid-West Sales Conference

(Continued from Page 18)

As a supplement to this, 69 heaters were installed for a trial demonstration period of 30 days, and 66 of these sold. These efforts resulted, as of January 1, 1936, in an automatic water heater saturation of 17 per cent of the customers.

Gas Refrigeration

K. W. Browne, Milwaukee Gas Light Co., told the Conference that gas refrigeration offers profit and additional load for 1936 and for many years to come. Through the increasing popular demand for domestic gas refrigeration, the industry will be able to combine the much sought for gas sales and a highly desirable merchandise profit, at the same time protecting the cooking load by the dramatic presence of the Electrolux in the customer's kitchen. The Milwaukee company recently formed a specialized refrigeration sales department, which has been so successful that at least one special Electrolux salesman for even the smallest company is advocated.

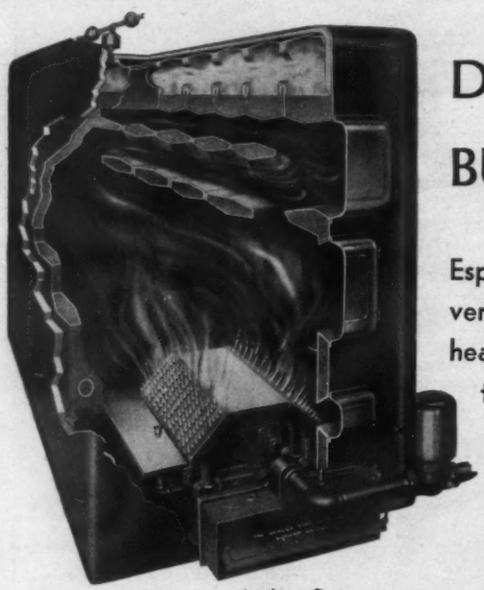
Continental Laying 44-Mile Natural Gas Pipe Line

Continental Oil Co., headquartering at Ponca City, Okla., late in January began laying a natural gas pipe line from the Tepetate Field, La., to Lake Charles, La. The gas line is being laid in the same trench with an oil line which the company also is constructing. The gas line is of 8-inch pipe, 44 miles long, and will supply the Mathieson Alkali Works at Lake Charles.

Route of the pipe lines starts at Conoco's Tepetate wells which are about 1½ miles southwest of Redlich in Acadia Parish. From this point it proceeds southwest across Bayou Nezpique and Jefferson Davis Parish, passing just south of Fenton, continues across Bayou Arsene into Calcasieu Parish, skirts the town of Marion, crosses Calcasieu River and terminates on the north shore of Lake Charles.

Owatonna Buys Distribution System

The city of Owatonna, Minn., is reported to have purchased the gas franchise and gas distribution system of the Interstate Power Co. serving Owatonna for $125,000, and will take possession May 1. Natural gas will be served by the city to domestic consumers from a belt line previously layed in Owatonna by the Minnesota Northern Natural Gas Co. to serve a few industrials and public buildings as a municipal undertaking.



DFC BOILER BURNER...Type D

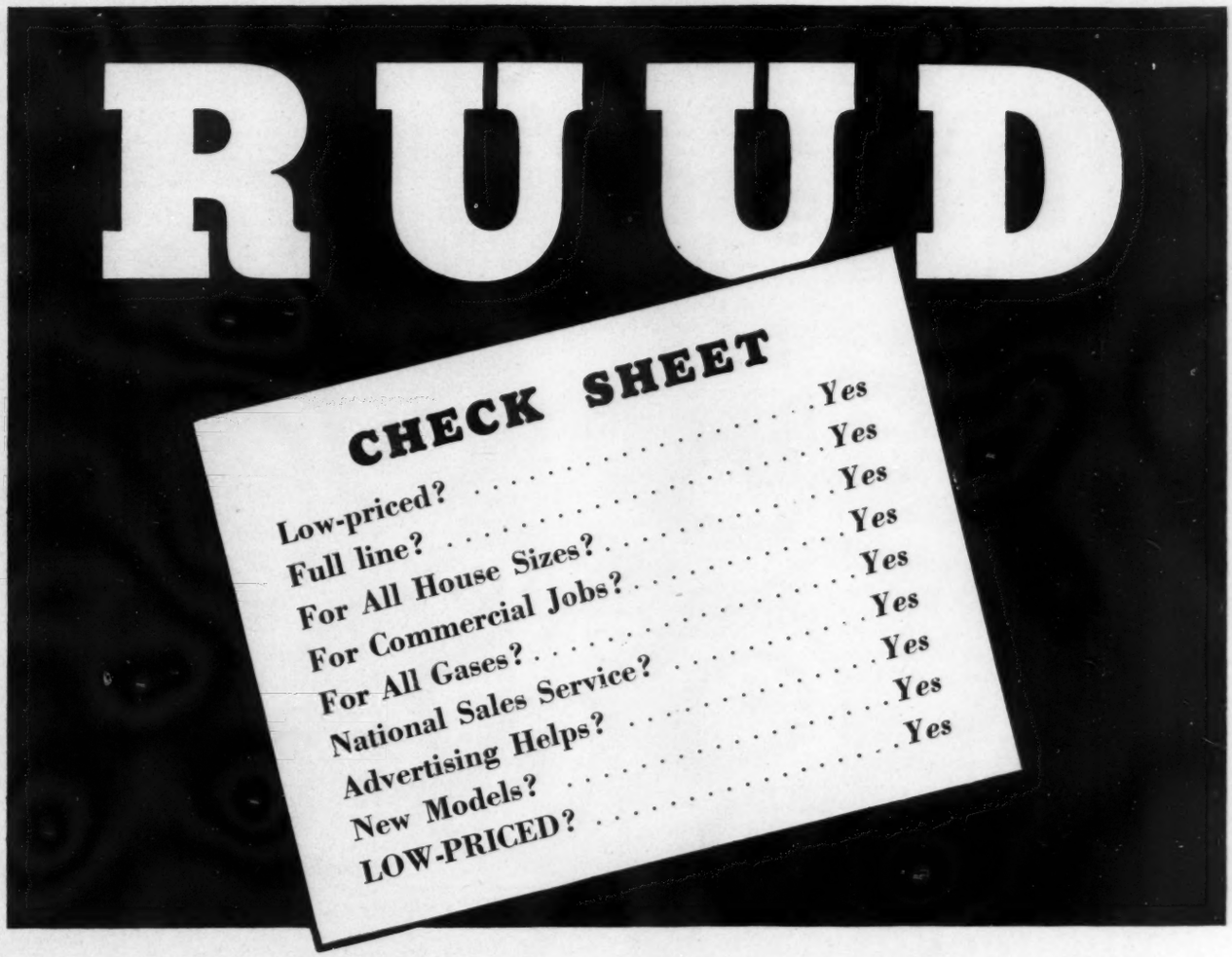
Especially developed for converting cast iron and steel heating boilers, any size or type.

Offers these distinct advantages:

1—Low first cost.
2—Easy to install.
3—Silent, efficient operation.
4—UNIT CONSTRUCTION. Suit every installation to exact load requirements.
5—Burners for any size and type furnace readily assembled from stock of only 2 sizes of head and 3 sizes of manifold.

Write for Bulletin 308

THE DENVER FIRE CLAY COMPANY
DENVER DFC COLO. U.S.A.
BRANCHES AT SALT LAKE CITY, EL PASO, AND NEW YORK



Check with RUUD for your 1936 gas water heaters . . . hand-fired and automatic, full-speed and low-speed, storage and faucet-action. RUUD is the all-markets line, blanketing every prospect from one faucet to a thousand. Made for all gas and water conditions. AND LOW IN PRICE!

Write For Complete Details

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RUUD WATER HEATER COMPANY
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RUUD MANUFACTURING COMPANY . . Factory at Pittsburgh, Pa.

LOW PRICED NEW MODELS

A. G. A. Distribution Conference to Meet April 6-8

THE A. G. A. Distribution Conference this year will be held from April 6 to 8, at Hotel Peabody in Memphis, Tenn. A feature of the program will be an address by an outstanding engineer who has been associated with the extension of natural gas through several states. The program and aims of the new Association of Gas Appliance and Equipment Manufacturers will be presented.

The sub-committee on pipe joints and materials, under the chairmanship of L. W. Tuttle, will report on expansion of mains, expansion joints, metals other than iron for pipe, and similar subjects.

G. E. Hitz, who originally developed the method of sealing bell and spigot joints with liquids, will give a paper on this subject. Lee Holtz, general superintendent of manufacture and distribution of the Southern California Gas Co., will discuss pipe protection practices on the West Coast including experiences with the use of Cellophane and Kodapack. Charles Turner, of Cleveland, Ohio, chairman of the sub-committee on pipe coating and corrosion, will call attention to the research on the various phases of this subject.

J. R. McQueen, of the Washington Gas Light Co., will outline his company's practices in the education of maintenance and construction crews with respect to customer service. C. H. Waring, of Kansas City, will present a paper on equipment and methods used in leak detection. David Allen, last year's meter sub-committee chairman, will present another report and H. B. Andersen, of the Philadelphia Gas Works Co., will submit a paper on "Meter Design", following up his initial paper on this subject last year.

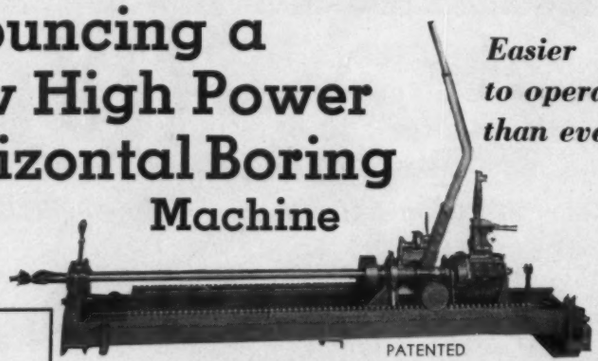
The luncheon conferences of last year will again have a prominent part in the coming sessions. D. P. Hartson is chairman of the Luncheon Conferences Committee. There will be five luncheon conferences which will convene at noon simultaneously on the first day and will devote as much of the afternoon as necessary to this activity.

The five conferences are "Portable Equipment", with Fred M. Goodwin, Boston Consolidated Gas Co., acting as chairman; "Meters", J. D. Von Maur, Consumers Gas Co. of Toronto, chairman; "Appliance Servicing", M. I. Mix, Peoples Gas Light and Coke Co., chairman; "Regulators, Automatic Control, etc.", H. E. Bates, Peoples Gas Light and Coke Co., chairman; and the fifth group will discuss "Pipe", covering such subjects as protective coatings, joint sealing materials, corrosion, repair, etc.

There is no set program for the luncheon conferences, and members may bring up for discussion any subject of interest to the group. The Luncheon Conference Committee has arranged for a general session on the morning of April 8, last day of the meeting, to review the subjects brought up at the five conference groups.

Announcing a New High Power Horizontal Boring Machine

Easier to operate than ever



PATENTED

FEATURES

- 5-horsepower airmotor gives 50% faster boring.
- New 4'8" boring bar sections easier to handle.
- Extra strong hi-tensile alloy boring bar joints.
- New shaped cutters both cut and undercut at the same time for faster boring.
- Short, rigid frame requires less ditching for setting-up.
- Higher speed boring insures greater accuracy.
- Bores holes 2½" to 14½".

Ths compact, high-speed Hydrauger model has been developed from many years' experience in building horizontal boring machines. It embodies features of the larger sized Hydraugers plus other important refinements.

It is a high-power, medium priced unit for rapid boring of horizontal holes up to 14½" in diameter.

Important advantages are: greater ease of setting-up and boring; straighter boring; lowest cost and fastest installation of underground piping; and minimum investment.

Hydrauger units are indispensable when installing wrapped or coated pipes. They have been widely used to prevent pavement cutting, ditching, traffic interruption, and destruction of lawns or gardens when installing horizontal piping. Installation costs are often reduced 90%. In many instances where pavement cutting permits were refused the Hydrauger was the only possible solution. Invariably a Hydrauger will pay for itself within one year and often on a single job. Ask for full details of the new Hydrauger Model 2A-2X.

HYDRAUGER CORPORATION, LTD.
116 NEW MONTGOMERY ST. SAN FRANCISCO

HYDRAUGER
"The Mechanical Gopher"

1935 Banner Year for Gas Service Co.

NEW business departments of the Gas Service Co., headquartering in Kansas City, Mo., during 1935 enjoyed the best business since 1930, based on rental and sale of appliances for the year. It is estimated that appliance sales and rentals made during 1935 will increase the load by more than one billion cu. ft. per year, and increase annual revenue by more than $600,000.

Total value of appliances sold and rented during 1935 is $1,920,267, of which $1,211,580 is credited to sales and $708,687, to rentals. Appliance and installation sales and rentals increased over the preceding year by $1,001,149, or a 108.9 per cent increase. Domestic and industrial customers increased 4,505. Total number of appliances sold and rented was 21,403, which includes 2,662 central house heating installations, 3,734 large capacity space heaters for complete heating of homes, 316 unit heaters, 1,853 radiant heaters, 5,643 ranges, 6,730 water heaters and 420 miscellaneous appliances. These figures represent an average of $8.28 in appliance and installation sales per customer.

Jones Appointed Standard Promotion Manager

The appointment of Arthur W. Jones as sales promotion manager has been announced by the Standard Gas Equipment Corp., of New York. Mr. Jones has had extensive experience in gas appliance and specialty merchandising fields. For several years he was advertising manager of the Standard Gas Equipment Corp. and later was associated with the Cramer-Krasselt Co., advertising agents, where he worked on the Norge refrigerator and Maytag washing machine accounts, as well as on that of Standard Gas Equipment Corp.

National Petroleum News Takes Oil Story to Layman

National Petroleum News, Cleveland, Ohio, in its February 5 edition published a Public Educational Issue of 516 pages, devoted to taking the layman reader inside the oil industry for a glimpse of its many services. Growing taxes levied upon petroleum products also received extensive treatment, as well as other economic factors affecting the industry. Special circulation of the issue was arranged to government representatives, bankers, and universities.

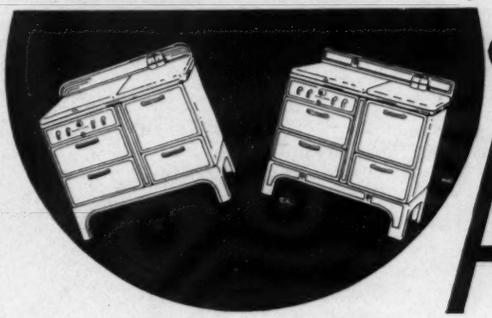
Utility Accountant Seeks Connection

A public utility accountant with 16 years experience, the last 12 with a large utility, seeks a new connection that affords opportunity. He is experienced in practically all departments of public utility accounting, and for the last six years was assistant to the auditor and financial executive. References and further information may be secured by addressing *Western Gas.*

1935 Yields 591 Michigan Wells

A total of 591 wells were completed in Michigan in 1935, according to press release, increasing the daily output of natural gas by 597,927,792 cu. ft. One hundred and seventy-seven dry holes were drilled.

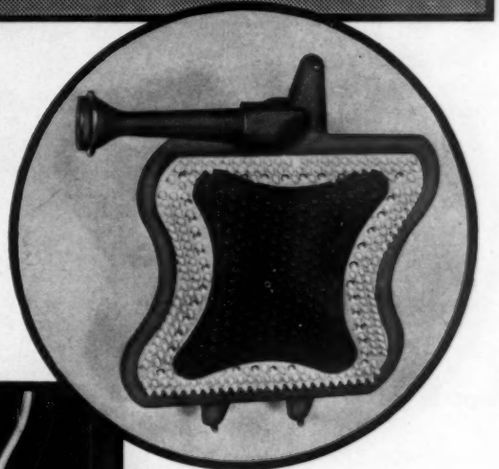
Sensational! AND NOW Fully AUTOMATIC



They Are Pointing Sales Curves UP. UP. UP. *for Every Progressive Dealer Who Is Displaying Them*

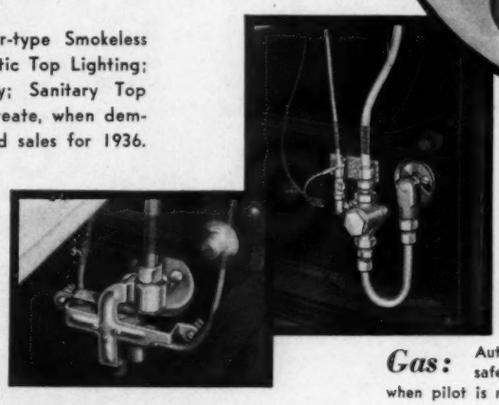
Detroit Jewel *Gas Ranges* Garland

WITH CERAMIC BROILER BURNERS AND AUTOMATIC OVEN LIGHTERS



Never in the past history of these two great lines of Gas Ranges have their features been so thoroughly basic . . . so thoroughly complete and efficient. Their beauty and automatic, perfect performance makes them the most self-selling ranges in America today.

With Ceramic Broiler Burners and Drawer-type Smokeless Broilers; Automatic Oven Lighting; Automatic Top Lighting; Oven Heat Control; Sanitary Oven Tray; Sanitary Top Burner Pan; Super Top Burners, etc., they create, when demonstrated, a buying urge that means record sales for 1936.



FOR COMPLETE INFORMATION *Write*

TWO TYPES OF LIGHTERS

Electric: Electric Automatic Oven lighting is offered with safety device preventing gas flow to burners until gas pilot has been automatically lighted.

Gas: Automatic Oven lighting by gas control, with safety device preventing gas flow to burners when pilot is not lighted.

DETROIT MICHIGAN STOVE CO.

Detroit, Michigan

Profitable DITCHING

with Barber-Greene's

Barber-Greene's Superior features: the Vertical Boom, Milling Action digging, Automatic Overload Release, Self-Cleaning Buckets and many others give profitable digging. They bring results like 7c a foot for a Washington Water Department (partly through hardpan) . . . 5c a foot for a Texas Gas Company . . . 2½c a foot for hundreds of miles of pipe-line trench. Send a card for "Ditching Snapshots and Records." There is no obligation.

Standardized Material Handling Machines

BARBER GREENE

715 West Park Ave., Aurora, Ill.

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SERIES 10 CIRCUIT

Exclusive with Minneapolis-Honeywell

ONLY Minneapolis-Honeywell can offer the control performance made possible by the exclusive Series 10 Circuit. That is one important reason why it pays to standardize on this superior line of controls. In addition your service department can operate more efficiently and will have fewer calls, and your stock room will have to handle only one line to fill all control requirements. Minneapolis-Honeywell Regulator Co., 401 East 28th Street, Minneapolis, Minn.

MINNEAPOLIS HONEYWELL

Control Systems

Effect of Distortion Upon Wear of Cylinders and Pistons

By ROBERT W. A. BREWER

Consulting Engineer, Huntingdon Valley, Pa.

At the annual meeting of the Society of Automotive Engineers, which was held in Detroit in January of this year, there were a number of important and interesting papers read and discussed on the subject of cylinder and piston wear.

The general consensus of opinion of the authors of these various papers was that although certain factors of design, construction, and material, have more or less definite effect on cylinder wear and ring operation, yet there were the causes unknown which produce conditions of abrasion, which could not be foreseen.

Although the discussion centered principally on lubrication and finish, of the surfaces, very little was said as to the effect of distortion which to me seemed to be a matter of paramount importance.

In opening the discussion I suggested that the one "mysterious" factor was probably distortion and that in other types of engines than those immediately under consideration, distortion was of extreme significance, in its effect upon the satisfactory operation of the finished product. I also stated that in certain constructions, where cylinder bores had other parts mounted upon them, the effect of tightening up the nuts, was such that in many cases a cylinder, as mounted on the engine, had entirely lost its original true form.

In reply to my remarks, one gentleman stated that he did not think one engine in a hundred thousand suffered from distortion. However, the same engineer in a paper contributed to the program stated that "cylinder distortion was a factor which had a pronounced effect on wear and that comparative tests became meaningless if head bolts were not tightened to the same tension for all tests."

This remark refutes the contention that cylinder distortion does not attain significance.

In further support of my suggestion I would refer to a slide which was shown by S. W. Sparrow of the Studebaker Corp. which illustrated a piston, one of many that had suffered under test. This piston showed a dry spot about the center of the skirt and to the side of the piston pin, which he stated was characteristic of pistons put in a certain cylinder on that particular engine.

He stated that by a change in the water jacket, this difficulty was entirely removed.

We know perfectly well that in early engines in which careful design was not incorporated in the water jacket, heat flow did very definitely cause distortion, and we cannot now say that design and construction is so perfected that these conditions no longer apply.

It is perfectly logical to expect that a complex casting, such as that of a cylinder, would be affected by wide differences of temperature in several localities. During severe weather conditions and low temperatures of incoming air, a gas engine, for example, is liable to effects from this cold air.

The same casting deals with exhaust gas temperatures which may be anything up to 1,000° F. In spite of the fact that thousands of engines do continue in successful operation under these conditions, it is well to be conscious of the facts.

We know perfectly well that cold water admitted to a hot cylinder will probably cause a crack. Cold air is equally effective and should be guarded against unless the design of the casting is such that distortion can occur without causing damage.

It would be interesting to have views of others upon this most important subject.

Chandler, Ariz., May Get Gas

The Central Arizona Light and Power Co. conducted a survey of Chandler, Ariz., in February to determine the advisability of installing a natural gas distribution system in the town. Cost of installing the system would be about $27,000, and a line would have to be built from the Western Gas Co. pipe line to supply the proposed system.

George F. Cruickshank Dies

George F. Cruickshank, who entered the employ of the Southern Counties Gas Co. in 1919, and until recently was district superintendent at Santa Monica, Calif., died last month at the age of 47.

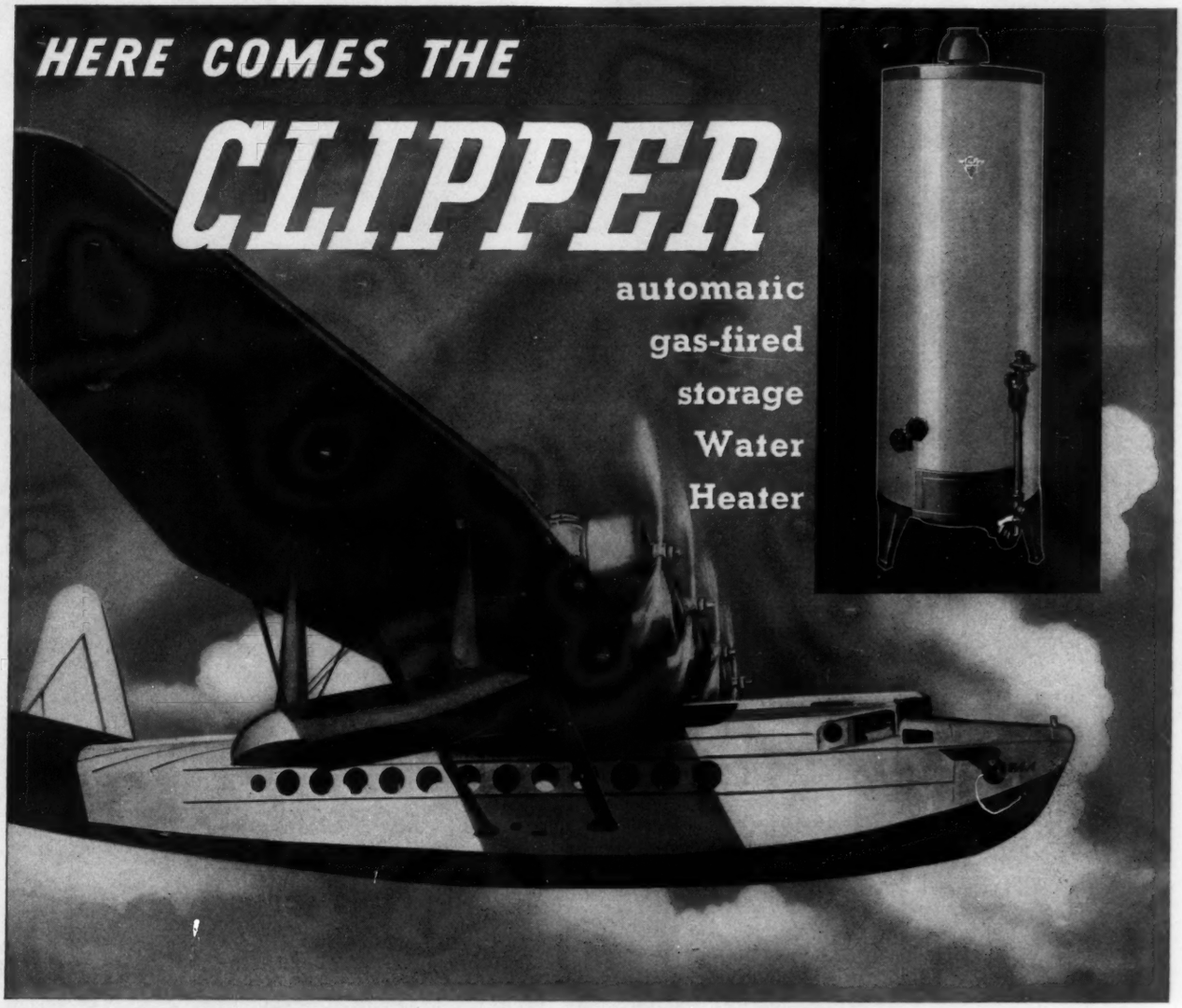
Hutchinson Rejects Municipal Gas Plant

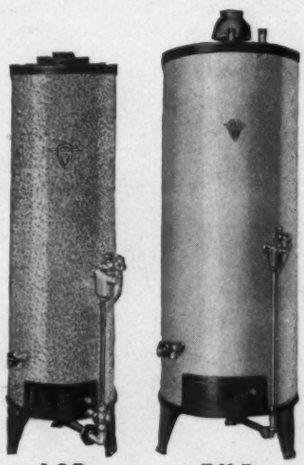
Citizens of Hutchinson, Kan., rejected a $564,138 revenue bond issue for financing a municipal gas plant in a very light vote on January 28. Hutchinson is served by the Gas Service Co.

A. G. A. E. M. Forms Legislative and Industrial Relations Committees

THE Association of Gas Appliance and Equipment Manufacturers has formed a Legislative Committee which will consider action to be taken on various Federal, state and municipal legislation that affects the industry. Members of the committee that have been appointed by President W. T. Rasch are W. F. Roberts, chairman, M. H. Feldman, Carl E. Froelich, F. H. Payne and J. A. Robertshaw.

John A. Fry, of Detroit, Mich., has been appointed chairman of the Industrial Relations Committee of the Association for the current year. Garry Sands, of Cleveland, Ohio, will serve with Mr. Fry and will deal with matters relating to labor. Other members of the committee are Arthur Friedman, Cleveland; E. R. Guyer, Chicago; W. P. Hutchinson, Bridgeport, Conn.; Bertrand B. Kahn, Hamilton, Ohio; L. R. Mendelson, Cleveland; and James Mitchell, Cleveland.





AGP REGULAR *Multiple Flue type*

THE DICTATOR *Single Flue type*

. . . supply you with a complete line of automatic gas-fired water heaters for every home and purse. Sure fire winners for your "Clean-up" Prize Contest. Write today for literature and new campaign designed to help you sell.

. . . NEWEST MEMBER OF THE LINE OF

AGP gas-fired WATER HEATERS

Here comes the Clipper! Eyes turn skyward to see the mighty flying boats that conquered the wide Pacific. Thousands thrill to that name today . . . as their great-grandparents did when the white hulled Clippers first blazed the trail to the East.

Now that famous name takes on new meaning. We chose it carefully. For the qualities that give it glamour are present too in this newest AGP automatic water heater: . . . constant, never failing service . . . rugged dependability . . . speed . . . and action . . . beauty . . . and popular appeal.

The AGP Clipper rounds out the line, fills the demand for an outside flue type gas-fired water heater. It has all the features people want, at the price they want to pay. It comes in five sizes from 15 to 40 gallons. The tank is copper bearing steel, galvanized. It is completely insulated under the gleaming baked enamel steel jacket. And, of course, it is completely automatic, with its dependability assured by the same honest workmanship that characterizes all AGP products.

The AGP Clipper will blaze new profit trails for you. Give it the opportunity. Complete details, specifications and prices are ready now. Write for them today.

AMERICAN GAS PRODUCTS CORPORATION
DIVISION OF AMERICAN RADIATOR COMPANY
40 WEST 40TH STREET · NEW YORK, N.Y.

STUDY THIS Construction

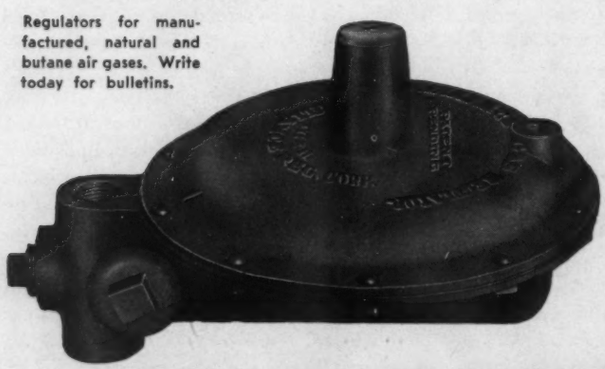
WHEN you study the actuating mechanism of this Reliance Regulator you will understand why it affords positive control of gas pressure. Types H and K Reliance Regulators will function accurately, efficiently and continuously with minimum maintenance expense. With these Regulators you may be sure of sensitive pressure regulation—positive lock-up when consumption ceases—minimum pressure-loss through the regulator —rugged construction.

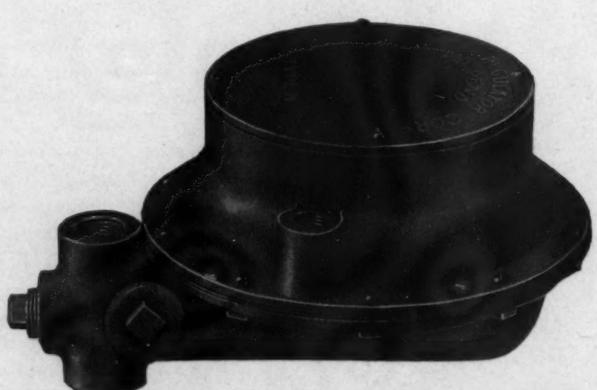
REGULATORS YOU CAN RELY ON — RELIANCE — SINCE 1910 — TRADE MARK

Reliance Type H or K regulators, Patent No. 1,931,777, are made in spring or weight loaded models, with mercury seals when required.

RELIANCE REGULATOR CORP.
1000 MERIDIAN AVENUE ALHAMBRA, CALIFORNIA

Regulators for manufactured, natural and butane air gases. Write today for bulletins.





RELIANCE REGULATORS

MEASUREMENT and CONTROL

SLIDE RULE SETTINGS for use in measurement work

By CHAS. J. SOYSTER

Richfield Oil Company of California*

THE slide-rule is almost indispensable to the meter man or to anyone using orifice meters.

Regardless of how accurately we may determine an orifice meter co-efficient, the fact still remains that the final gas or liquid volume computed from the meter chart is no more accurate than the least accurate step in arriving at this final volume.

CHAS. J. SOYSTER

Orifice meter charts measure from 3⅝ to 4 inches from zero to the maximum reading. More than three significant figures cannot possibly be read from the chart. The scale of the smallest 5-inch slide-rule is a more magnified scale than that of the meter chart, and will yield three significant figures as easily as the chart. The final computed volume will also be accurate to three significant figures. However, when the first significant figure is 1, four figures may be read from the rule.

In the following paragraphs occasional reference is made to the recent C.N.G.A. Bulletin No. TS-353, "Tentative Standard Procedure for the Measurement of Natural Gas with Orifice Meters."

Conversion of Square-Root Chart Readings to "Pound-Inch" Chart Readings: One of the most useful slide-rule settings for the orifice meter man, is that for the conversion of square-root chart readings to the old-style chart readings. It is quite possible that square-root charts will be used almost universally when a ready means is learned for translating readings from one style of chart to another. A few examples will make the method clear. Remember that the pounds or inches is always on the top or A scale, and the square-root chart reading is on the bottom or D scale. In between, on the B scale, is set the range of the meter or spring, as the case may be.

Example 1: Square-root chart reading is 7.65, meter maximum is 50. Find h (inches of water). Setting: Set index on C scale over 7.65 on D. Above 50 on B, find 29.3 inches on A. We have squared 7.65 and multiplied by 50/100. The square-root chart readings are the exact square-roots only of 100-inch meter readings in inches of water. The 29.3 inches would be converted to 7.65 by exactly the same setting.

Note: In setting figures on the A and B scales, it should always be remembered that figures with an even number of digits to the left of the decimal should be set on the right half of the rule, and with an odd number on the left half.

Example 2: Square-root chart reading of pressure pen is 8.85. Spring is 250 pounds. What is the pressure? (Zone 2.) Setting: Set index on C over 8.85 on D. Above 250 on B find 196 pounds absolute pressure on A. Subtracting Zone 2 atmospheric pressure of 14.54 from 196, gives 181.46, of which we are justified in using certainly not more than four figures, or 181.5 pounds gauge pressure. Here we have squared 8.85, then multiplied by 250/100 to find absolute pressure with one setting. Remember that absolute pressures and not gauge pressures are always used on the rule, and also that inches of mercury vacuum must be converted to absolute pressure in pounds per sq. in.

Example 3: Given square-root chart reading 5.45, using 24.7 spring. What is the vacuum in inches of mercury? (Zone 1, Atmospheric pressure is 14.66.) Setting: Set index on C over 5.45 on D. Above 24.7 on B find 7.35 pounds absolute on A. 7.35 from 14.66 gives 7.31 *pounds of vacuum,* which, divided by the conversion factor 0.491, gives 14.9 inches of mercury vacuum.

Example 4: Given 12.3 inches of mercury vacuum, using 24.7 spring. Find square-root chart reading. (Zone 5. Atmospheric pressure is 14.17.) Multiply on the rule 12.3 by 0.491 (factor for converting inches mercury to pounds pressure). Product is 6.04 *pounds vacuum;* 6.04 subtracted from 14.17 gives 8.13 pounds absolute pressure corresponding to 12.3 inches mercury vacuum for Zone 5. Now set 24.7 on B under 8.13 on A. Under index on C find 5.73 on D.

Atmospheric Pressure Settings for the Static Pen: A special case of the conversions given in the above paragraphs is to find the atmospheric settings for different pressure springs. Since no tables are published showing static pressure pen settings for all different pressure springs and elevation zones, the slide rule will prove to be especially useful in this case.

Example 5: What is the atmospheric pressure setting for 50-pound spring on a square-root chart? (Zone 1. Atmospheric pressure is 14.66.) Set 50 on B under 14.66 on A. Under index on C find 5.41 on D.

Example 6: Find Zone 4 (Atmospheric pressure is 14.29) atmospheric pressure setting for 24.7 spring. Under 14.29 on A set 24.7 on B. Under index on C find 7.61 on D.

For convenience a few Standard Barometric Pressures for Different Altitudes are given from Table 17, C.N.G.A. Bulletin TS-353:

Zone No.	Elevation Limits (feet)	Std. Barometric Pres. (Lbs. per sq. in.)
1	0— 249	14.66
2	250— 499	14.54
3	500— 749	14.42
4	750— 999	14.29
5	1000—1249	14.17
6	1250—1499	14.04

Gas Gravity Factors. Specific gravity factors, as given in Table 13, Bulletin TS-353, can be read from a slide-rule to the third decimal place. We solve by dividing 1 by the gravity, and extracting the square-root, with one setting of the slide.

Example 7: What is the specific gravity factor for a gas with a gravity of 0.685? Under index on A, set 0.685 on B. Under index on C find 1.208 on D.

Gas Temperature Factors: Table 14, Bulletin TS-353. In this case we divide

$$\frac{460 \text{ plus } 60}{460 \text{ plus } T}$$

and extract square root with one setting.

Example 8: What is the temperature factor for gas at 150° F.? Under 460 plus 60 on A, set 460 plus 150 on B. Under index on C, find 0.923 on D.

Meter Factors, or M Values, for Square-Root Charts: Table 16 of the bulletin. These M factors can be read with one setting of the slide.

Example 9: Find M for a 20-inch meter with a 24.7-pound spring. Set right index of B to 24.7 on A. Under 20 on B find 22.2 on D. M is equal to 1 per cent of 22.2, or 0.222.

The M factor converts the "pound-inch" coefficient to the square-root chart coefficient.

Example 10: How does the coefficient or capacity of a 100-inch meter compare with that of a 50-inch meter? Set left index of B under 50 on A. Under 100 on A, find 1.414 on C. The coefficient and capacity of the meter, using the same orifice, will be multiplied by 1.414, or will be increased 41.4 per cent.

Calculation of "Pound-Inch" Charts: Pressure extension books or special slide rules are

* Presented before the Southern California Meter Association, January 23, 1936.

not necessary, although there is some inconvenience in taking the extensions from the rule where gas is measured under a vacuum. It may be done as shown above in Examples 3 and 4, but is more easily done by making a table or graph for the particular elevation zone, showing the relation between vacuum and absolute pressure. "Pound-inch" charts are calculated with two settings of the slide. Set index on B under absolute pressure on A. Under differential pressure on B, find pressure extension on D, by using runner. Without moving runner, multiply by coefficient on C and D scales.

We might add another example under the heading of *Meter Factors.* Installations are not uncommon where a high and a low range meter are used on the same orifice, say a 10 and a 100-inch meter. If the 10-inch meter is reading 9.75, what should the reading be on the 100-inch meter? In this problem the square-root chart readings vary inversely as the square-roots of the meter sizes. By inverting the slide, readings of any range meter will be found on the D scale under the meter sizes on the inverted B scale. For example, set 10, the center index of the inverted B scale, above 9.75, the 10-inch meter reading. Under 100 on B, find the 100-inch meter reading for the same orifice. Likewise, under 50 inches appears 4.37, and under 20 inches is 6.89—readings of 50 and 20-inch meters respectively, for the same orifice and flow. This comparison may also be made by reading CI scale opposite A scale, without inverting slide.

An approximate rule for *computing new cofficients or meter capacities* for slight changes from standard orifice sizes: It can be used with a very small error for interpolating between any two of the published coefficients. It assumes that the flow varies as the square of d, which of course is not exactly true. To illustrate, given a gas coefficient of 115.14 for a 2 by 0.750 plate, what would be the coefficient for a 2 by 0.780 plate? Setting: Over 0.750 on D, set 115.14 on B. Above 0.780 on D, find 124.8 on B. This result is about 0.3 per cent high.

These examples will suggest numerous others which may be solved quickly with the slide-rule.

Industrial Gas Men to Inspect Plant Installations

THE first industrial gas sales conference that has been held under the auspices of the Industrial Gas Section of the A. G. A. in a number of years will be held at Hotel Statler, Detroit, Mich., on March 10 and 11. The two-day conference will consist of one day devoted to papers and discussions, and one day to an inspection trip of new and outstanding industrial gas installations in some of America's most up-to-date factories.

The first day will be devoted to the presentation of papers and to discussions which will cover both sales and equipment. The Detroit plants that will be visited by the industrial gas men are the Chevrolet Motor Co., the Detroit Steel Products Co. and the Detroit-Michigan Stove Works.

Charles W. Gale, chairman of the Industrial Gas Section, will preside over the sessions on March 10. Following are the papers to be presented:

Morning

Selling Industrial Gas to Recently Developed New Heat Markets—Frank T. Rainey, new business manager, the Ohio Fuel Gas Co., Columbus, Ohio.

What Gas Has to Offer the Ceramic Industry Today—T. E. Wood, manager, Industrial Gas Department, The Manufacturers Light & Heat Co., Pittsburgh, Pa.

Effective Methods of Handling Test and Trial Installations—F. B. Jones, director of industrial gas sales, Equitable Gas Co., Pittsburgh, Pa.

Following luncheon will be an address entitled, "The Business Side of Industrial Gas—Claude A. Welch, assistant superintendent, Chevrolet Motor Co.

Afternoon

What Are the New Business Possibilities of a Greater Use of Convection Gas Heating in Industry?—Charles E. Buysse, president, Industrial Heating Equipment Co., Detroit, Mich.

New Developments in the Brass and Copper Industry and the Part Gas Is to Play in This Industry—W. W. Young, Jr., industrial gas engineer, Connecticut Light & Power Co., Waterbury, Conn.

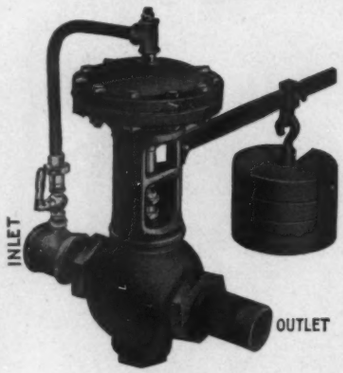
How Atmosphere Furnaces Offer a New and Effective Tool for Greater Gas Sales—E. G. de Coriolis, research director, Surface Combustion Corp., Toledo, Ohio.

Displacing Competitive Fuels with Gas, as Exemplified in the Automobile Industry—Hale A. Clark, industrial engineer, Detroit City Gas Co., Detroit, Mich.

Adequate Pressure

or

NONE



C-F

C-F Back-Pressure or Check-Pressure Regulator

Where a well needs to be protected from depletion, or pressure in one part of a system needs to be kept higher than in other parts, or for any reason it is desirable to check flow altogether when pressure falls to a set minimum, the C-F Back-Pressure or Check-Pressure Regulator will serve the purpose unfailingly. Pressure below the desired minimum will not be sufficient to hold the valve open against the weights imposed; therefore the valve closes and flow definitely ceases.

Write for Bulletin 2099 giving complete description, also catalog of C-F Regulators for all pressure-control uses, known as the best for fifty years.

THE CHAPLIN-FULTON MFG. COMPANY

28-40 Penn Avenue **Pittsburgh, Pa.**

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OR ANY JOBBER

Meter Hi-Jinks Brings 250 to Vernon

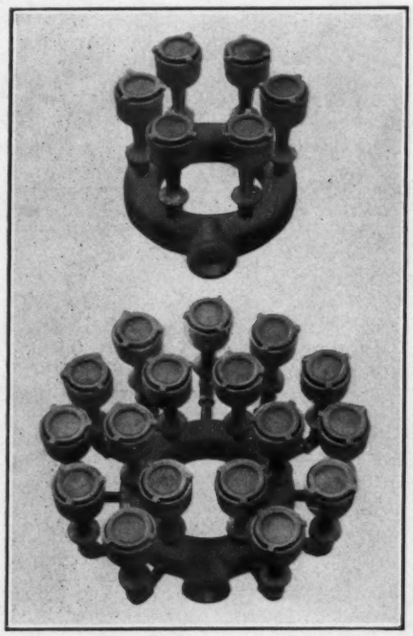
SOUTHERN California Meter Association's 9th Annual Hi-Jinks, held Saturday evening, February 29 at the Central Manufacturing District Club in Vernon, set a new high for entertainment and general enjoyment, with some 250 members and friends on hand to share it. Geo. Christen of the Crosby Steam Gage & Valve Co., Inc., chairman of the Association's entertainment committee, set up the program with the assistance of a capable committee. In the group handling arrangements were F. S. Burt, W. L. Cowan, Paul Daniels, D. W. Darnell and Oliver Muff, in addition to Chairman Christen.

For the March 26 meeting President F. E. Bradley announces that the S.C.M.A. will hold a joint session with Pacific Coast Gas Association Technical Section members, at the Los Angeles Gas and Electric Corp. auditorium. Dinner will be served in the cafeteria of the same building. Several entertainment numbers are promised, together with a strong program of papers and discussions.

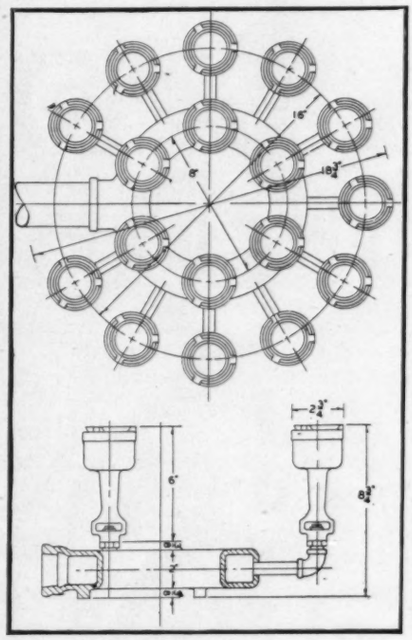
Scott Opens Los Angeles Office

Gordon Scott, formerly American Petroleum Institute research associate, has opened offices in the Richfield Building, Los Angeles, to engage in consulting work.

AN UNSURPASSED BURNER FOR SMALL VERTICAL BOILERS



AT LEFT: Illustrated are two N.G.E. type 340 Burner Units; this photograph shows the flexibility with which extra burners may be added, by manifolding, to increase capacity.



AT RIGHT: Diagramatic sketch showing the N.G.E. type 340 burner assembly. 8" manifold, with 1¼" gas connections and 10" manifold, with 1½" gas connections are available, meeting all capacity requirements of boilers of this type.

FOR installations in service stations, dairies and cleaning and dyeing establishments—or for service in similar installations, where a small vertical boiler is operated under moderately high pressure, the N.G.E. type 340 gas burner is unexcelled. Although designed primarily for this type of service, it may also be applied to other installations where an efficient, round, upshot burner is required.

The correct number of heads can be supplied for gas capacities up to 1850 cu. ft. of gas per hour. Each burner head has a capacity of 25 cu. ft. of 1180 BTU gas per hour, with a pressure of 6 inches of water.

The design and size of the type 340 permits it to be installed in the boiler, without changes or alterations to the boiler, and without the necessity of removing or loosening pipe fittings or tilting the boiler.

As in all N.G.E. Gas Burners, it operates on the venturi principle of entraining the major portion of the air required for combustion by the pressure energy of the gas issuing from an orifice into the venturi throat of the burner.

The type 340 burner has given unsurpassed results in hundreds of installations where efficient, **economical** performance was the measure of its success. It operates quietly at all rates of firing, it does not flutter or vibrate, it does not require any maintenance or attention; first cost is low and it is ruggedly built for a lifetime of hard service.

Investigate the many merits of the N.G.E. type 340 for all small vertical boiler installations. When ordering specify inside diameter of boiler, gas pressure available and maximum boiler rating required. Additional information and blueprints furnished upon request.

N. G. E.
TYPE 340
BURNER

NATURAL GAS EQUIPMENT INC.

Petroleum Securities Bldg.
Los Angeles

1123 Harrison St.
San Francisco

1024 Truxtun Ave.
Bakersfield

LOOK TO THE PIONEERS FOR CONTINUED LEADERSHIP

AT LEFT

Typical Advertising copy in the current Minneapolis-Honeywell automatic heating and air conditioning consumer campaign.

Minneapolis-Honeywell Directs 1936 Advertising at Consumer

CONSUMER advertising plans of Minneapolis-Honeywell Regulator Co., for the current year call for stimulation of interest on the part of consumers, large space operators, and industry in automatic heating and air conditioning, according to George B. Benton, advertising manager of the company. Starting in January with full-page and two-column copy in "Time," "Collier's," "American Home," "Nation's Business," and "Business Week," the company initiated the campaign under the general theme, "Be Modern —Install Automatic Heating and Air Conditioning."

This campaign will continue through March and April, and will be followed immediately by another campaign aimed at the public under the general heading, "Air Conditioning is Knocking at Your Door." This phase of the appeal will stress the fact that air conditioning will pay big dividends in health and comfort to the home owner and reward liberally the hotel, apartment or theatre owner in increased patronage and satisfied customers. Industry is also reminded of the fact that year 'round air conditioning improves plant processing and employee efficiency. This campaign will continue throughout the months of March, April, June and July in national magazines.

A further effort in selling the public by selected territories on the urgency of "Installing Automatic Heat Now," will be launched in August, to stimulate fall business. There will also be a magazine campaign in the "Saturday Evening Post," "Time," and other national publications, urging the public again, to install air conditioning, with emphasis on winter humidification.

In connection with the campaign, an informative booklet entitled "This Thing Called Automatic Heating and Air Conditioning" has been published by the company, and is a general discussion in layman's language of the essentials of automatic heating and air conditioning. The entire campaign will involve over 32,000,000 individual advertising messages to consumers, exclusive of all newspaper and trade advertising of the company, which would add a like number of individual appeals.

Mississippi Power & Light Gets 1936 Merchandising Under Way

THE Mississippi Power & Light Co., heaquartering at Jackson, Miss., is featuring a figure known as the "Happy Homer" in its current advertising. The Happy Homer, who symbolizes complete home service, is dressed in a gaudy uniform resembling a bellhop's garb. He made his debut in Mississippi newspapers on Sunday, January 26, in the first installment of a three-month merchandise advertising program.

The company's first gas appliance campaign for 1936, in which the Happy Homer will participate, is a drive called the "Happy Morning Natural Gas Automatic Water Heater Special," which got under way January 27 to run until March 14. During this drive automatic gas water heaters are offered for $5 down and the balance in 18 monthly payments.

As an aid to its dealer cooperative activity, the Mississippi Power & Light Co. issued in January, Vol. 1, No. 1, of a house organ for dealer circulation entitled the "Sales Dynamo." The "Sales Dynamo" is a tabloid size paper, the first issue consisting of 12 pages and featuring the Happy Homer on the front page.

Commission Hears Petition for Grand Rapids Pipe Line Project

THE State Utilities Commission of Michigan held a hearing the middle of February on the petition of the Grand Rapids Gas Light Co. to serve the city of Grand Rapids with mixed gas. The commission expects to write an order covering its decision on the proposal within a thirty day period according to William M. Smith, chairman of the Commission.

Grand Rapids Gas Light Co., one of several proposing to bring natural gas to the city, would construct a 10¾-inch line from the gas wells in Belvidere Township in Montcalm Country to Grand Rapids, a distance of approximately 60 miles. The line would cost in the neighborhood of $844,000.

The General Gas Transmission Co. and the Western Michigan Pipeline Co. are among those seeking the opportunity to supply the district with natural gas.

According to press reports, engineers of the Grand Rapids Gas Light Co. estimate that between 21 billion and 35 billion cu. ft. of gas is available in the Michigan field, with 13 billion of this being accessible for the Grand Rapids project. Other engineers surveying the field have estimated the available supply as high as 60 billion cu. ft. or a sufficient supply to provide the city with straight natural gas for a 10-year period.

Charles A. Harrison Appointed to Toledo Edison Post

Charles A. Harrison, formerly with the Cities Service Co., New York, in a gas engineering capacity, has been transferred from New York to become assistant general manager of the Toledo (Ohio) Edison Co. Prior to his New York post, Mr. Harrison was connected with the Public Service Co. of Colorado at Denver. He is a member of the Advisory Council of the A. G. A. and last year was chairman of the Technical Section.

J. A. Strozier has taken over Mr. Harrison's former duties in the valuation and rate department of Cities Service. J. R. Wohrley is engaged with other duties in operation of gas properties.

McCarter Medal Presented Peoples Employees

Presentation to seven employees of The Peoples Gas Light & Coke Co. of the American Gas Association's McCarter medal for saving human life was made a feature of the annual meeting on January 24 of the Peoples Gas Club, employee organization of the Peoples company. Two thousand employees and their families witnessed the ceremony.

The seven men who saved lives using the Schafer prone pressure method of resuscitation, were Nicholas DeFina, Raymond Shanaberger, Nicholas Olker, A. H. Slinn, Fred Lorenz, Howard B. White, and Arnold Menet. Awarding of medals to these men raises the total of Peoples Gas employees so honored to 34.

Japanese Engineer Inspecting Gas Properties on Extensive Trip

Tetsuji Aoki, engineer for the South Manchuria Gas Co., Ltd., Darien, Manchuria, arrived in Los Angeles in February. He plans a trip of several months duration, visiting gas properties in Los Angeles, San Francisco, Chicago, New York, London and other centers. He will spend about three weeks in Los Angeles, proceeding to San Francisco and then east.

BUTANE-PROPANE NEWS

BOTTLED GAS DISTRIBUTION

Heavier Capital Investment Points Trend Toward Long-Term Profits

By H. EMERSON THOMAS

Eastern Representative, Philgas Department, Phillips Petroleum Company
President, National Bottled Gas Association

THIS study of costs which enter into the distribution of bottled gas is the second which Mr. Thomas has prepared for the Butane-Propane News department of WESTERN GAS. Since publication of the original analysis in the issue of October, 1931, practices and conditions then current in the industry have changed radically, setting up new bases for establishment of cost factors. For example, at the time of the original study major middle-western and eastern marketers were leasing bottled gas equipment to customers for an installation charge of $36.50, whereas the charge now commonly set is $9.75.

H. EMERSON THOMAS

As Mr. Thomas points out in these pages, the trend in bottled gas operations is definitely toward extending a superior customer service and taking profits over a considerable period of time. Western Gas is indebted to the author for his basic analysis, which reflects operations covering many thousands of customers.—EDITOR.

MANY changes have taken place during the development of bottled gas sales and operations in the past few years. The industry has grown from a large number of small units, usually handling bottled gas as a side line, into a somewhat fewer number of organizations that are specializing in bottled gas marketing and service work. During the original promotional period, many producers or "brokerage distributors" sold or allotted territories to individuals or companies for the distribution of their products. The owner of the territory franchise then usually purchased all of his appliances, customers' equipment and gas containers from the producer or brokerage distributor. This meant that generally the local operators set up their own type and quality of service and worked on a more or less "hand to mouth" merchandising basis.

A large number of the local dealers, although there are numerous exceptions, worked as individuals and without correlation or cooperation with other operators selling and servicing the same trade-name product. The majority worked from their residences or marketed bottled gas as a side line to other major activities.

Since that initial development and promotoional period, the bottled gas industry has naturally progressed more and more toward the larger type of organization, having a more direct contact with the consumer. It has become necessary that these companies have considerable capital with which to carry on sales and development work. The capital required has increased very materially on a per customer basis due to the decided trend in sales and merchandising activities and policies discussed below.

A number of years ago, domestic bottled gas utilization equipment, excluding cylinders and appliances, was sold to the customer at a charge of from $125 to $200. This price was based on the theory that a merchandising profit should be made in the selling of the equipment. Such a policy, however, naturally restricted the potential users to that very small part of the population in the high income brackets and beyond the gas mains.

The second phase of bottled gas marketing history began in about 1928, at which time the general merchandising policy was changed from that of outright sale of equipment at a profit, to the policy of leasing the equipment to the customer upon payment of an installation charge of approximately $36.50. This installation charge only partially covered the cost of equipment, selling and installation, but such a low charge meant that a substantial investment had to be incurred, or a merchandising loss suffered in the obtaining of new customers.

Lowering the initial cost to the consumer and placing the equipment on the lease basis, removed bottled gas from the position where it was available only to the well-to-do class and brought it to a level where the average individual could afford it. Needless to say, this greatly stimulated sales and during the period from 1928 until 1931, the increase in number of new customers was very rapid. In subsequent years the full force of the "depression" was felt by the potential consumers and the bottled gas marketers and the rate of sales dropped off very materially.

As a result of the lower number of sales per year, with a resultant higher cost per customer obtained, plus the added fact that a higher degree of saturation in the average and higher income bracket was being reached, a third phase of marketing evolution came into effect.

In the Spring of 1935, the installation charge was reduced from $36.50 to $9.75 by the majority of bottled gas marketers. This again added impetus to the selling activities, and has resulted in a greatly increased rate of sales for the industry. However, it has had another very decided effect, namely, the placing of the bottled gas business even more in the position where well-financed operating companies are necessary to meet the heavy requirements for cash to cover cost of customers' equipment, selling expense and other necessary expenditures, prior to any possible pay-out of the investment. In other words, the immediate financing was almost completely removed from the new customers to the marketing companies.

It is also well to pause and reflect on another situation that has arisen in the past few years. This is the problem of increased intensive competition from marketers of other fuels, notably electricity. The electric appliance manufacturers in their advertising have consistently stressed the appeal that an electric range is modern and gives conveniences to the housewife which are claimed to be not available with other fuels. We, as gas men, all know that a modern gas range, with insulation and heat control, is superior to the best modern electric cooking appliance. However, we must not be blind to the fact that the electric appliance manufacturers and the electric utilities are making an extremely strong appeal to the public on this and allied points. Very decided electric rate reductions have been put into effect in many territories, which, coupled with very liberal trial periods and long time financing of appliances, have caused many prospects to become interested in electricity as a cooking and water heating fuel.

Although electricity is the major competitor from a modern and agressive standpoint, nevertheless the industry should not neglect the continued competition from less conven-

TABLE NO. 1. GENERAL INVESTMENT REQUIREMENTS FOR BOTTLED GAS OPERATIONS.

	625 Customers	1,000 Customers	2,000 Customers
A. General Investment on Operations			
Trucking equipment	$ 500.00	$1,500.00	$2,500.00
Reserve customers' equipment, fittings, etc. 20 at $20.61	412.20	412.20	412.20
Tools and operating equipment	200.00	400.00	600.00
Office furniture	300.00	400.00	600.00
Appliance inventory	1,000.00	1,000.00	1,000.00
Miscellaneous investment	200.00	400.00	500.00
Total Investment Exclusive of Cylinders	$2,612.20	$4,112.20	$5,612.20
B. Cylinder Investment per Customer			
Cost of two 100-pound cylinders installed per customer with valves, f.o.b. factory			$18.22
Cost of one-half cylinder in reserve with valves, f.o.b. factory			4.56
Freight on cylinders			1.65
Cylinder Investment per Customer			$24.43

TABLE NO. 2. GENERAL COSTS CHARGEABLE TO SALES.

		Cost per Installation—(Assuming 125 New Sales Each Year)
(1) Sales supervision per year	$1,500.00	$12.00
Store rent for display, sales office, etc., at $50 per month	600.00	4.80
Office Expense:		
(2) Bookkeeper and stenographer $936.00		
(3) Telephone, light, supplies, etc. 360.00		
	1,296.00	10.37
(4) Car expense	288.00	2.30
(5) Taxes, insurance, etc.	100.00	.80
Total	$3,784.00	$30.27 per job

(1) Salary of manager or owner $2,000; assuming three-quarters of his time, spent on sales, then 75% of $2,000 or $1,500 chargeable to this item.

(2) Based on $130 per month or $1,560 annual; 60% of time on sales or $936 chargeable to sales.

(3) Annual costs of $600; 60% chargeable to sales.

(4) Total $360; 80% chargeable to sales or $268.

(5) Total taxes, insurance, audit, etc. $300; 33⅓% charged to sales.

ient fuels such as kerosene, gasoline, oil, coal and wood. Both from a mechanical and an appearance standpoint, appliances using these fuels have been distinctly improved in the past few years, over their now obselete predecessors. The major sales of such appliances are primarily in the replacement field where bottled gas should be making more adequate progress.

As has been pointed out above, the competitive fuel and appliance situation has become much more intense and threatening since the original days of bottled gas marketing. Such changes have made it vital for the bottled gas marketers to arrange more appealing advertising, develop improved sales approaches to the prospective users, extend more liberal trial period offers, finance bottled gas appliances over an increasingly greater number of years; offer more modern ranges with heat control and full insulation and modern styling and spend added money from an advertising and merchandising standpoint to sell the prospect on the advantages and economies resulting from the use of gas instead of other fuels for cooking, hot water heating, refrigeration and other miscellaneous uses in the home. Such a program requires a well conceived plan, backed with ample capital to make the necessary expenditures and investment in cussomer development and equipment and appliance financing. In the past few years, lack of sufficient available capital has required many marketers to restrict their activities very decidedly and, as a result, a number of them have merged with or sold out to other organizations with a stronger financial structure.

Economic developments in the bottled gas industry in the past few years have placed it in the class of businesses *built on a long term pay-out investment structure, rather than on an immediate merchandising profit structure.*

As a large majority of the marketers have been schooled in and have developed their business on the merchandising profit basis, they have not been converted easily in their policies and thoughts to the long-term investment type of business. Their lack of capital was generally a powerful factor in their slow change from one fundamental policy to the other. The result has been that the companies which approached the development problem with the basic policy that they were in a business that required a substantial cash investment in each customer added, have obtained in recent years by far the larger proportion of the new customers.

A detailed study of the investment requirements and operating costs for bottled gas distribution was felt to be highly advisable; therefore tables have been prepared based on experience showing such investments and costs. These are based on average minimum needs and, in many cases, the requirements would be even larger on investment, and costs higher on operations.

As a general assumption, the figures used are based on 125 sales each year and on furnishing gas service to 625, 1000, and 2000 customers. The 625 figure has been used as representative of the number of customers served after a typical five year sales program. It is possible in some instances for the number of sales each year to be larger for a given company, and such larger sales would change the figures somewhat, but not to a major degree, in regard to average investment per customer and average operating cost per pound. The cylinder investment per customer is the largest single item in investment; therefore even though a reduction might possibly be made in the investment per customer because of a larger number of customers served, nevertheless the total cylinder investment per customer would not be reduced appreciably.

In regard to the operation costs, into which have been reflected the losses from initial sales activities, the important costs would remain constant and only certain general costs would be reduced. It is estimated that upon doubling the number of assumed sales per year, the operating costs, including selling losses, would not be reduced over 5 to 10 per cent.

The initial cost or investment to set up a bottled gas operating company includes the general investment necessary for trucking equipment, tools, office furniture, appliance inventory, a supply of equipment for leasing to customers and an initial supply of cylinders. Table No. 1 sets out these requirements, depending upon the number of customers. It should be noted that the minimum general investment is $2,612.20, which is needed even before starting operations. To this base investment must be added the investment in cylinders for customers' service, and for each customer $24.43 must be available in the cylinder investment account. This is based on two cylinders being installed at each customer's location and one cylinder being in reserve for each two customers served. The reserve cylinders are those in transit, in warehouse, at bulk station, out of service for repairs, on delivery truck, or in other places.

We will now take up the general costs chargeable to sales, and in Table No. 2 sales supervision, store rent, office equipment, car expense, taxes and insurance have been itemized. It should be observed that the salary of the manager or owner of the business has been set at a low figure of $2,000 per year, and that 75 per cent of this, or $1,500, has been assumed as chargeable to sales, the balance being chargeable to operations. It is also assumed that the manager, or owner, will be doing some selling of appliances directly to the consumer. Table No. 2 indicates

that the general cost per customer sold runs $30.27.

The next general item to be considered, before consolidating the various costs, is that shown in Table No. 3, namely general operating costs. It will be noted that this covers operating supervision, warehouse rent, office expense, car expense, etc. This is set out on a basis of serving 625, 1,000 and 2,000 customers.

One of the most interesting and probably the most misunderstood item in costs in bottled gas merchandising is that of the supposed profit on making the original sale. Table No. 4, "Costs and Revenue on Installation Sales" is based on the average type appliance sold to bottled gas users throughout the United States. The appliance cost f.o.b. factory has been taken as $40, with $35 write-up. To this has been added the $9.75 revenue from the customer installation charge, which gives an average revenue per sale of $84.75. The costs applicable against this are outlined in this table and include the costs of the customer leased equipment (excluding cylinders), an average sales commission of 20 per cent, a trade-in allowance of $5 (actually lower than the average trade-in), advertising costs and credit losses. It will be noted that the total cost, or out of pocket money when an appliance is sold is $98.16, while the distributor receives $84.75 gross revenue, which leaves him with an immediate net cash expenditure of $13.41 per new customer.

Table No. 4 also sets out the costs and revenue on installation sales where *no* appliance is sold. Here it will be seen that the net cash requirement per new customer sold amounts to $22.41, due to loss of the assumed appliance profit.

We now have some basic costs and investment requirements that can be consolidated into a picture that will show the general investment and operating costs of a typical bottled gas company.

Referring to Table No. 5, "Investment and Capital Charges," column (4) shows the decrease of general investment per customer as new customers are added, column (5) shows the investment per customer in cylinders, and column (6) shows the rapid increase in investment for cylinders as new customers are added. The total of these investments is set out in column (7), and column (8) shows the yearly charges that must be set aside to cover the investment. These capital charges of 16 per cent are made up of interest at 6 per cent, and depreciation at 10 per cent. As will be noted by column (9), the average pounds of propane per customer per year

TABLE NO. 3. GENERAL OPERATING COSTS.

	Number of Customers Served		
	625	1,000	2,000
(1) Operating supervision per year	$ 500.00	$ 500.00	$2,300.00
(2) Rent for warehouse for storage of cylinders, reserve equipment, appliances, garage, etc.	240.00	960.00	960.00
(3) Bookkeeper and stenographer	624.00	1,944.00	1,944.00
Additional personnel for collection, maintenance, etc.	0.00	1,440.00	2,880.00
(4) Office expense, telephone, light, heat, etc.	240.00	600.00	600.00
(5) Car expense	72.00	792.00	792.00
(6) Taxes, insurance, etc.	200.00	600.00	900.00
Total General Operating Costs	$1,876.00	$6,836.00	$10,376.00

(1) See Table No. 2. With 2,000 customers, assistant manager would be required.
(2) $20.00 per month covers small space in outside store and warehouse. On 1,000 customers, company would have to have own store, warehouse, etc.
(3) See Table No. 2 for 625 customers. On 1,000 customers additional employee at $110.00 per month.
(4) See Table No. 2.
(5) See Table No. 2 and on 1,000 and over customers, an extra car is necessary.
(6) See Table No. 2.

TABLE NO. 4. COST AND REVENUE ON INSTALLATION SALES.

	Where an Appliance Is Sold	Where an Appliance Is Not Sold
Cost Items:		
Appliance cost, f.o.b. factory	$40.00	.....
Appliance freight	3.00	.....
Cabinet (Lots 12 to 24), f.o.b. factory	8.80	$ 8.80
Cabinet lock	.30	.30
Cabinet base	.60	.60
Regulator with manifold and pigtails, relief valve	6.41	6.41
Freight on above equipment (estimated)	1.60	1.60
Piping or tubing and fittings	3.50	3.50
Installation cost (including labor, truck time, etc.)	6.00	6.00
Sales Commissions at 20%*	15.95	1.95
Trade-in allowance on appliance (average)	5.00	.....
Advertising	3.00	3.00
Credit losses	4.00	.....
Total Cost Items per Installation	$98.16	$32.16
Revenue Items:		
Appliance (average sales price) $75.00		.....
Installation charge 9.75		9.75
Total revenue per sale	84.75	
Net loss per customer sold, exclusive of sales supervision, management costs, general overhead such as light, heat, insurance, etc., that are directly chargeable to sales	*$13.41*	*$22.41*

* Commission is figured on net retail price of appliance after deduction of trade-in.

TABLE NO. 5. INVESTMENT AND CAPITAL CHARGES.

(1) Year of Operations	(2) Number of Customers	(3)* Total General Investment	(4)* General Investment Per Customer	(5)* Cylinder Investment Per Customer	(6) Total Cylinder Investment	(7)* Total of All Investment	(8)* Capital Charges 16%	(9)* Pounds Propane per Customer Per Year	(10) Propane Sold in Pounds	(11) Capital Charges per Pound
First	125	$2,612.20	$20.89	$24.43	$ 3,053.75	$ 5,665.95	$ 909.00	350	43,750	$.0208
Second	250	2,612.20	10.45	24.43	6,107.50	8,219.70	1,395.00	350	87,500	.016
Third	375	2,612.20	6.97	24.43	9,161.25	11,773.45	1,879.00	350	131,250	.0143
Fourth	500	2,612.20	5.12	24.43	12,215.00	14,827.20	2,388.00	350	175,000	.0137
Fifth	625	2,612.20	4.18	24.43	15,268.75	17,880.25	2,880.00	350	218,750	.0132
	1,000	4,112.20	4.11	24.43	24,430.00	28,542.20	4,560.00	350	350,000	.0131
	2,000	5,612.20	2.81	24.43	48,860.00	54,472.20	8,695.00	350	700,000	.0124

*Column: (3), (4), (5), See Table No. 1. (7) Column 3 plus Column 6. (8) Interest 6%; Depreciation 10%. (9) Estimated that 350 pounds will be sold and delivered on the average during first year's operations. (See discussion.) Slide rule calculations.

TABLE NO. 6. GENERAL OPERATING AND MAINTENANCE COSTS.

(12) Annual Fuel Load in Pounds	(13) Cost of Fuel per Pound	(14)* Delivery Cost of Fuel per Pound	(15)* Operating Cost Charg. to Fuel Sales	(16) Gen. Operat. Costs per Pound	(17) No. Cylinders Purchased Each Year	(18) Total Cylinders Owned	(19) No. Cylinders to Maintain	(20)* Maint. Costs per Year at $.35 per Cyl.	(21) Maint. Cost per Pound	(22) No. Cylinders Retested	(23)* Cost of Retesting at $2.50 per Cyl.	(24) Retesting Cost per Pound Total Load
43,750	$.0525	$.0225	$1,876.00	$.0428	312	312	.....	.....	.....	.....	.....	.....
87,500	.0510	.0215	1,876.00	.0214	313	625	312	$109.20	$.0013	.....	.....	.....
131,250	.0495	.0210	1,876.00	.0143	312	937	625	218.75	.0017	.....	.....	.....
175,000	.0490	.0205	1,876.00	.0106	313	1,250	937	327.95	.0019	.....	.....	.....
218,750	.0485	.0200	1,876.00	.0086	312	1,562	1,250	437.50	.0020	312	$780.00	$.0036
350,000	.0445	.0195	6,836.00	.0195	313	2,500	2,187	767.50	.0022	313	782.50	.0022
700,000	.0415	.0190	10,376.00	.0148	313	5,000	4,687	1,641.00	.0024	313	782.50	.0011

*Column:

14. Includes transportation from bulk station to distributing point.
15. Table No. 3.
20. Maintenance charges per year at $.35 made up of $.15 painting, and $.20 valve and other cylinder maintenance each year.
23. Includes transportation to and from point for retesting; necessary to retest cylinders every five years.

TABLE NO. 7. TOTAL COSTS AND NET INCOME ON FUEL SALES.

(25) Total Propane Sold in Pounds	(26) Cost of Fuel per Pound	(27) Delivery Cost per Pound	(28) Capital Charges per Pound	(29) General Operat. Costs per Pound	(30) Maintenance Cost per Pound	(31) Retesting Cost per Pound of Total Load	(32) Total Costs per Pound	(33) Average Selling Price	(34) Net Operating Income per Pound	(35) Total Net Income from Gas Sales
43,750	$.0525	$.0225	$.0208	$.0428	$	$	$.1386	$.115	($.0326)	($1,032.50)
87,500	.0510	.0215	.016	.0214	.0013	.....	.1112	.115	.0038	332.50
131,250	.0495	.0210	.0143	.0143	.0017	.....	.1008	.115	.0142	1,863.75
175,000	.0490	.0205	.0137	.0106	.0019	.....	.0957	.115	.0193	3,375.00
218,750	.0485	.0200	.0132	.0086	.0020	.0036	.0959	.115	.0191	4,178.12
										$ 8,416.87
350,000	.0445	.0195	.0131	.0195	.0022	.0022	.1010	.115	.0140	4,900.00
700,000	.0415	.0190	.0124	.0148	.0024	.0011	.0912	.115	.0238	16,660.00

Note: Figures in ( ) indicate losses.

TABLE NO. 8. NEW INSTALLATION SALES.

	(36)* Total Marketer Sales Yearly	(37)* Loss on Customers Equipment Where Appliance Is Sold	(38)* Of Total 125 Sales Avg. No. on Which Appliances Are Sold	(39)* Total Net Loss on Customers' Equipment Where Appliance Sold	(40)* Loss on Customers' Equipment Where No Appliance Sold (Conversions, Etc.)	(41)* No. of Sales on Which No Appliances Are Sold Out of Total 125 Sales	(42)* Total Sales Loss where no Appliances are sold	(43)* Total Net Loss on Customers Equipment from Installation Sales	(44)* General Costs Chargeable to Sales	(45)* Total Net Sales Cost	(46) Cumulative Total Sales Loss
First	125	($13.41)	90	($1,206.90)	($22.41)	35	($784.35)	($1,991.25)	($3,784.00)	($ 5,775.25)	($ 5,775.25)
Second	125	($13.41)	90	($1,206.90)	($22.41)	35	(784.35)	(1,991.25)	(3,784.00)	(5,775.25)	(11,550.50)
Third	125	($13.41)	90	($1,206.90)	($22.41)	35	(784.35)	(1,991.25)	(3,784.00)	(5,775.25)	(17,325.75)
Fourth	125	($13.41)	90	($1,206.90)	($22.41)	35	(784.35)	(1,991.25)	(3,784.00)	(5,775.25)	(23,101.00)
Fifth	125	($13.41)	90	($1,206.90)	($22.41)	35	($784.35)	($1,991.25)	($3,784.00)	($ 5,775.25)	(28,876.25)
Total for 5 Years	625	($13.41)	450	($6,034.50)	($22.41)	175	($3,921.75)	($9,956.25)	($18,920.00)	($28,876.25)	

Note: Figures in ( ) indicate losses.

* Column:

(36) Number of installations sold per year.
(37) See Table No. 4.
(38) Out of 125 dealer installation sales, average number appliances sold equal 90, leaving 35 installation sales without appliance sales.
(39) Column (37) multiplied by column (38).
(40) See Table No. 5.
(41) See (38) above.
(42) Column (40) multiplied by column (46).
(43) Sum of column (39) and column (42).
(44) See Table No. 2.
(45) Sum of columns (44) and (45).

has been assumed at 350, and with this base figure, the capital charges per pound are outlined in column (11). These range from $.0208 to $.0124, and expressed in cost to the distributor per 100-pound cylinder, amount to $2.08 to $1.24, every time that the cylinder is filled. Many companies have blinded themselves to this fact and have not set up proper reserves to cover it. As cylinders become obsolete or must be withdrawn from service due to natural wear and tear and obsolescence, they do not have the money with which to purchase replacement equipment.

As will be noted above, it has been assumed that the average customer will use 350 pounds of propane during any one year. It is estimated that, during the first year operations, this same quantity of 350 pounds per customer on the average, will be sold and delivered, even though not used. Two cylinders or 200 pounds of propane will be delivered at the same time the customer's equipment is installed. It is estimated that there will be an average consumption, with consequent average delivery of an additional 150 pounds during that same year. The same reasoning is applied to new customers during succeeding years, for an estimate of their average consumption during the same year in which they are sold.

Table No. 6, "General Operating and Maintenance Costs," sets out some interesting figures based on correlated data on many operating companies. The cost of the fuel has been shown in column (13), and is based on the average current prices in distributors' cylinders at an operating bulk station. The bulk station prices vary somewhat, but not greatly; in some instances, the gas is purchased by the distributor at the production point, and in such the gas cost may be somewhat lower because tank car freight to a bulk station and storage costs are eliminated, but the increased transportation cost of the gas in cylinders to the distant point of consumption generally makes such costs excessive. Also there are many obvious operating and investment disadvantages in the long cylinder haul by rail or truck.

Column (14) indicates the delivered cost of the fuel on a per pound basis to the retail customers. This cost also varies, depending

TABLE NO. 9. NET PROFITS OR LOSS FROM ALL OPERATIONS.

Total Number of Customers	(47)* Total Net Income or Deficit from Gas Sales	(48)* Total Net Annual Sales Cost	(49)* Net Income or Deficit All Sources	(50)* Assuming Sales by Manager or Otherwise on Which no Commission is Paid and thus Additional Income Commission per Installation	(51)* Assumed Number of Installations Sold by Manager	(52)* Total Commission Not Paid	(53)* Total Net Profit or Loss
125	($1,032.50)	($5,775.25)	($6,807.75)	$15.95	30	$478.50	($6,329.25)
250	332.50	(5,775.25)	(5,442.75)	15.95	30	478.50	(4,964.25)
375	1,863.75	(5,775.25)	(3,911.50)	15.95	30	478.50	(3,433.00)
500	3,375.00	(5,775.25)	(2,400.25)	15.95	30	478.50	(1,921.75)
625	4,178.12	(5,775.25)	(1,597.13)	15.95	30	478.50	(1,118.63)
5 Year Operations							($17,766.88)
1,000	4,900.00	(5,775.25)	(875.25)	15.95	30	478.50	(396.75)
2,000	16,660.00	(5,775.25)	10,884.75	15.95	30	478.50	11,363.25

Note: Figures in ( ) indicate loss figures.

* Columns:

(47) See Column (35) Table No. 7.

(48) See Column (45) Table No. 8.

(49) Sum of Columns (47) and (48).

(50) 20% of 79.75—Refer to Table No. 4.

(51) No. of sales assumed to have been sold by manager.

(52) Column (50) multiplied by Column (51).

(53) Sum of Column (52) and Column (49).

upon methods of operation, and is used as a minimum figure. In cases where deliveries are made close to the point of distribution, the costs may be lower, but the same distributor generally has customers scattered over a wide area and the higher costs for the greater distances bring up the average.

The operation costs of a general nature, chargeable to fuel sales, shown in column (15), are those determined from Table No. 3, and column (16) shows these broken down into cost per pound.

Another item that is many times disregarded in making an analysis of the potential costs of operation is that of cylinder and equipment maintenance. Columns (18), (19), (20) and (21) represent the maintenance cost and these are based on a figure of $.35 per cylinder per year. Another very important item is that of cylinder retesting. All Interstate Commerce Commission cylinders, for use in transportation, must be retested every five years to comply with the Commission's regulations. Many companies have never had their cylinders retested because they do not ship them by rail, but handle all transportation by truck. However, these cylinders, subject to shocks and rough handling in transport, should be retested in accordance with Interstate Commerce Commission regulations. It should also be kept in mind that interstate trucking by common carrier has now been placed under the jurisdiction of the Interstate Commerce Commission and of the Bureau of Motor Carriers of the Federal Government, thus requiring these cylinders to comply, from a retest standpoint, with the I. C. C. regulations as though they were shipped by rail. There is necessity of setting up provisions, in an estimate of operating expenses, for the retesting of these cylinders. This retesting has been estimated at $2.50 per cylinder, including the cost of taking the cylinder out of service, shipping it to a retest point, retesting in a water jacket, and putting it back into service again.

In Table No. 7, the costs on a per pound basis of the fuel, delivery costs, capital charges, general operating costs, maintenance and cylinder retesting cost, have been shown. Column (32) gives the total cost per pound depending upon the different numbers of pounds sold per year. The cost in the first bracket, which covers the first year of operation, shows an average of $.1386, with decreasing costs per pound, as added customers are served.

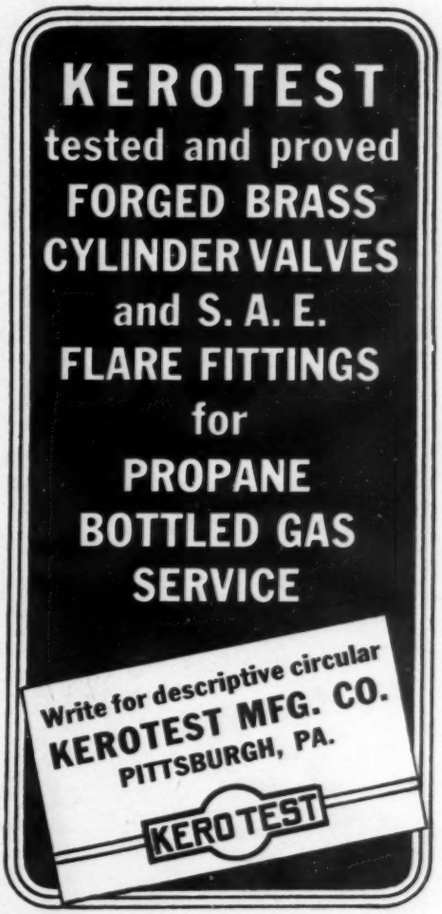
Column (33) assumes an average retail selling price of $.115 per pound for all customers (which figure is doubtless on the high side). Many companies with the sliding scale type of price schedule in effect, which reduces the price to the customer as larger volumes per month or per year are consumed, have lower than $.115 average income per pound. Column (34) gives the net operating income per pound, and it will be seen that in the first bracket there is a loss on all gas sold. In the second bracket a slight profit is shown but some net profit is made on the larger consumptions per year. This net operating profit has been transposed into dollars per year in column (35). Before leaving this table, it should be noted specifically that these net profit figures are only those from the gas sales and do not cover the overall picture.

Now, referring to Table No. 8, the losses from merchandising activities are depicted. The total sales per marketer per year are assumed as 125, and experience has shown that appliances are not sold to all customers that are obtained. Thus, as per column (38), only 90 of the 125 new customers purchase a stove from the marketer. The loss on each of these customers averages $13.41. Column (39) shows the total net loss on such customers to be $1,206.90 per year. In addition to this, there were 35 customers on which no appliances were sold, thus resulting in a sales loss of $22.41 each, or, as per column (42), a loss of $784.35. These losses total $1,991.25, column (43), and adding to this the general cost chargeable to sales of $3,784.00, column (44), we have a total net sales cost or loss per year, as set out in column (45), of $5,775.25.

From the tables already discussed, we can now arrive at a consolidation to determine the net profits or losses from all operations. Table No. 9, column (49) shows the dollar loss per year, and there is an overall net loss each year until such time as more than 1,000 customers are served; however, if 2,000 customers are served, the yearly profit amounts to $10,884.75. As was stated earlier, the sales manager or owner would make some sales directly to the consumers on which no commissions would be paid. Therefore, this has been consolidated into Table No. 9, and as per column (53), the net loss is reduced by $478.50 per year.

The thought will undoubtedly occur to the reader that with the profit being shown from gas operations and a considerable loss on new sales, less effort should be put into the obtaining of new users and the sale of appliances, and the marketer should concentrate on gas delivery. It should be borne in mind that it is impossible to develop the gas volume to a point where the operations will be profitable without intensive work on the sales end, thus resulting in the gas load being eventually directly proportional to the effort and cost of the sales activities.

In conclusion, it is evident from the figures shown that: first, a merchandising profit is not generally possible in the sale of bottled



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gas appliances and the leasing of utilization equipment to new customers; second, that a substantial cash investment must be incurred, to cover general equipment and cylinder investment to properly serve the bottled gas users; third, that the capital charges on this large investment constitute an important cost item in operating charges; fourth, that equipment maintenance and cylinder retesting, although they are items that are generally disregarded in preliminary analysis of bottled gas distribution costs, are nevertheless items of great financial importance; fifth, that bottled gas marketing and servicing does not become profitable until around 1,500 customers per marketer have been obtained; sixth, that approximately $40,000 net investment in physical equipment is the minimum required to obtain and serve the 1,500 customers which are necessary to permit profitable operations; seventh, that in addition to the physical investment of $40,000, there would be cumulative losses on sales activities of approximately $20,000, resulting in a total minimum investment and expenditure of $60,000 before reaching a consistently profitable operating stage; and eighth, that increasing pressure from electricity and other competing fuels, will probably result in progressively decreased bottled gas retail prices, with a resultant narrowing of the already thin profit margin, and a rapid increase in the cash requirements necessary before attaining enough active customers to be on a profitable operating basis.

Refinery Production Planned by Wasatch Oil at Woods Cross

Wasatch Oil Refining Co., Salt Lake City, Utah, is contemplating the installation of a plant to extract butane and propane from refinery vapors at its Woods Cross refinery 6 miles north of Salt Lake City. As tentatively planned, the plant would have a capacity of 1,250 barrels a day.

Several of the company's technical staff were on the west coast in January investigating butane-propane production and utilization phases, including William Yates, general manager; A. G. Coppins, chief chemist; F. R. Hanson, chemist; and Gilbert D. Moyle, sales department.

Bryant Heater Co. Issues New Catalogue on Air Conditioning

Bryant Heater Co., Cleveland, Ohio, has issued a new catalogue on its air conditioning equipment which is attractively gotten up in three colors with illustrations of outdoor scenes symbolizing the advantages of year-round gas air conditioning and indoor scenes showing the appliances in their settings. The catalogue stresses the efficiency of gas-fired air conditioning equipment by linking it with the superiority of gas as a heating and air conditioning fuel.

Powell Appointed Mississippi Sales Supervisor

J. J. Powell, who was dealer coordinator for the Mississippi Power & Light Co. last year, has been appointed state sales supervisor for the company for the current year. Mr. Powell will travel throughout the company's territory in the interest of dealer cooperation.

Ruud Issues Comprehensive Portfolio of Sales Aids

RUUD MANUFACTURING CO., Pittsburgh, Pa., recently issued a portfolio of sales and advertising helps that is one of the most comprehensive efforts of its kind undertaken to date. The portfolio is spiral-bound and is 2 inches thick, containing nine sections, each of which is a portfolio in itself.

The first section is entitled "The Salesman" and contains a salesman's presentation book which is attractively gotten up in color, setting forth by means of illustrations the uses and merits of gas water heating. This section also contains 16 leaflets and pamphlets illustrated in color describing the Ruud line of water heaters and furnishing addition sales presentation helps.

The second section, "Direct Mail," has three series of mailing pieces and a 15-page pamphlet entitled "The Ready Letter Writer," which contains samples of form letters grouped under various classifications of appeals. One of the mailing series consists of 12 individual pieces in color recommended for circulation to selected prospects and for salesmen's follow-up. Another series is composed of six "Housekeeping Charts" which are four-page color folders dealing individually with the application of gas water heating to the different phases of housekeeping, and are punched in one corner so that they can be hung up for ready reference by the housewife. The third series is a group of 10 advertising post cards which tell a progressive story of gas hot water perfection on one side, with the other side left blank for imprinting the local message.

The third section of the portfolio is under the heading of "General Folders and Displays"; the fourth, under "Newspaper Advertising," containing a large number of layout and copy specimens; the fifth contains literature for the employee, home service representative and the plumber.

The next three sections deal respectively with the company's conversion heaters, tank water heaters and volume and commercial water heaters. As in the other sections, these contain appropriate literature for promotion ammunition. The last section, entitled "Miscellaneous," presents several ideas for sales stunts, special attractions, etc., among them a set of astrological charts covering the twelve months of the year, with suggested procedures for distribution.

Price lists for the literature are attached to each set, the price including imprinting of the individual company's message in a space provided for the purpose on all pieces.

Pacific Lighting Corp. Companies Report Increased Earnings for 1935

The three operating companies of the Pacific Lighting Corp. which headquarter at Los Angeles report net earnings for the 12 months ending December 31, 1935, as follows:

Los Angeles Gas and Electric Corp.—$4,058,968, or an increase of $638,779 over the same period in 1934.

Southern California Gas Co.—$3,072,592, or an increase of $1,379,371.

Southern Counties Gas Co.—$1,249,649, or an increase of $520,577.

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YOU can save TIME and MONEY with the GREENLEE Hydraulic Pipe Pusher

The Greenlee Hydraulic Pipe Pusher is self-contained. It operates on a notched steel base, so that it is necessary to reset the pipe clamp only every 4 to 7 feet, depending on the length of base used. By taking advantage of hydraulic pressure, this tool has been made very compact and easy to operate. One man, standing in a comfortable position, can exert the maximum pressure of 40,000 pounds on the pipe clamp. Capacity is provided for pipe from 1¼ to 4-inch.

It doesn't make much difference how the underground installation of pipe has been made, in order for the Greenlee Hydraulic Pusher to show real savings. It does away with much trenching, backfilling, tamping, etc.; it saves tearing up lawns and pavement; and it shows a time and labor saving over the pushers that require several men to operate them when difficult soil is encountered. All that is necessary with the Greenlee is to make a trench long enough to accommodate the pusher with a section of pipe, and one man can furnish sufficient power to send it where it is wanted, simply by pumping the levers. It is easily set up, and there are eight speeds provided for varying soil conditions.

GREENLEE TOOL CO.
1700 Columbia Ave.
ROCKFORD, ILLINOIS

LET US SEND COMPLETE DETAILS

GREENLEE TOOL CO., 1700 Columbia Ave., Rockford, Ill.
Please send complete details on the Greenlee Hydraulic Pipe Pusher.

Company .....
Address .....
City ..... State .....
By WG3-36

COMMITTEE
A. C. Joy, (P. G. & E.)
Chairman
J. S. Spaulding
(L. A. G. & E.)
Forrest Raymond
(San Diego Cons. G. & E. Co.)

Load Building News
P. C. Gas G. A.
THE MODERN FUEL

COMMITTEE
Douglas Buckler
(So. Calif. Gas Co.)
W. D. Thurber
(So. Counties Gas Co.)
Clifford Johnstone
Managing Director
(P. C. G. A.)

VOLUME 8, NO. 3 *Eighth consecutive year of regional cooperative advertising, Pacific Coast Gas Association* MARCH, 1936

MODERN GAS COOKING BOOSTED BY MARCH ADVERTISING AND PUBLICITY

Double-Action Message Stresses Up-to-Date Gas Kitchens in All Consumer Publications Used

Display advertising and publicity articles, prepared under the direction of the Cooperative Advertising Committee, feature the modern gas range in March.

The full-page advertisement reproduced at right appears in "Sunset" Magazine covering the entire Pacific Coast and in club-women's and parent-teacher magazines. Complementing the advertisement, articles on the same subject appear in news columns of these same publications.

Carefully designed to appeal to housewives, the advertising and publicity stress outstanding qualities of modern gas cooking—low cost, automatic control, speed and cleanliness. Thousands of women are influenced by these impressions; and thus are more easily converted into "prospects" for gas appliances that build load.

Additional Gas Promotion

Other new P. C. G. A. advertisements for March are:

Architects & Builders: Gas heating and air conditioning in new Sunkist Building, Los Angeles. (Architect and Engineer; California Arts & Architecture).

Appliance Dealers: Model Gas Kitchen and gas appliance merchandising of W. H. Picard, Inc., Oakland, outstanding plumbing store of the Coast (Western Plumbing & Heating Journal).—Paul's Furniture Store, Salinas, finds profit in gas appliance selling (Western Furniture Retailing).

Commercial Cooking: Desert Inn, Palm Springs, nationally-famed winter resort, installs unusual gas cooking installation (Pacific Coast Record; Western Hotel Reporter; Keeler's Pacific Hotel Review).

Commercial Baking: Schweitzer's Pies and Cakes, Los Angeles, finds gas best for quality, uniform production (Western Baking).

Revolution in the Kitchen
Model Gas Kitchen
I know why mother bought a GAS range
"Lots of times when grown-ups think I'm playing with my dolls, I'm really listening. Last week at Mother's bridge party, all the ladies got to talking about cooking and every one of them liked a gas range best, so . . ."
. . . and so, Mary Jane, your Mother's friends confirmed her own conclusion. Experience has taught them all that Gas is:
QUICK—The only fuel that gives instant, full heat for speedy breakfasts and other "timed" meals.
CLEAN—Delivered clean, burns clean. No ashes, smoke, soot or grime.
DEPENDABLE—Rare indeed is any interruption of gas service.
CONTROLLABLE—Literally thousands of heat variations at your finger tips.
ECONOMICAL—A gas range is moderate in first cost; inexpensive to install, to operate, to maintain (seldom a part-replacement in years of service).
Every modern feature you've wanted or dreamed of, and pin money will budget the new, low payments. Details, demonstrations, gladly given by your Gas Company or Appliance Dealer. Is it a shopping "date" for tomorrow?
PACIFIC COAST GAS ASSOCIATION, INC.
(A non-profit service organization of which your Gas Company is a member)
447 SUTTER STREET · · SAN FRANCISCO, CALIFORNIA
PUT THEM ALL TOGETHER THEY SPELL
M-O-D-E-R-N
Every Degree of Heat—Economical, too, even heat for perfect waterless cooking; quick, high heat for speed-broiling.
New Super-Broiler—Seals in juices, flavors; eliminates smoke and odors; easily cleaned.
Automatic Lighting and Control—Instantaneous burner lighting. Automatic oven heat-control. Time-clock dials turns ovens on and off while you're away.
Insulated, Rust-proof Oven—for fuel-thrift, durability and easier kitchen. Flat, sliding-arm racks that can't tip.
Kitchen Heater—Inexpensive—Optional on most types. (Some have built-in gas circulating water heaters.)
Utility Drawers—(cozy-rolling) for utensils.
Long Life—Solid, strong, sturdy, with rust-less, washable porcelain finish, inside and out.
—but discover all the other features for yourself!
Gas
THE MODERN FUEL

RIGHT: *Facsimile of full-page advertisement appearing in March consumer publications*

LEFT: *Typical publicity article clipped from "California Federation News"*

With the ASSOCIATIONS

Programs Set for P. C. G. A. Conferences

ANNUAL spring conferences of the Pacific Coast Gas Association are dated for the latter part of this month in Los Angeles, with a comprehensive program already arranged. The Accounting Section and the Sales and Advertising Section meet on March 19 and 20, while the Technical Section conference is scheduled a week later, March 26 and 27. All meetings are to be in the Los Angeles Gas and Electric Corp. Building at 810 South Flower St. Several luncheon and dinner meetings to be staged in the cafeteria of the same building are included in the program, which appears below for all three of the conferences:

ACCOUNTING SECTION

Lester E. Green, General Chairman

THURSDAY, MARCH 19

9:30 A. M. in Auditorium

Joint meeting with Sales and Advertising Section to discuss sales and accounting aspects of long term financing. (See Sales Conference Program.)

12:15 P. M.

Luncheon in Cafeteria adjacent to Auditorium.

2:00 P. M.—Room 930

Customer Accounting as It Affects Public Relations—A discussion led by O. L. Moore, Los Angeles Gas and Electric Corp.

Customer Deposit Policies—A discussion led by M. W. Gibson, Seattle Gas Co.

FRIDAY, MARCH 20

10:00 A. M.—Room 930

How Long Should We Keep Our Typewriters?—The conclusions of a recent study by Robert Frizelle.

Standardization of General Service Forms—A discussion led by M. A. Seeley, Los Angeles Gas and Electric Corp.

The Bi-Weekly Payroll—A discussion led by J. M. Bourus, San Diego Consolidated Gas and Electric Co.

12:15 P. M.

Joint Luncheon with Sales and Advertising Section in Cafeteria on Twelfth Floor.

2:00 P. M.—Room 930

Use of the Degree Day Method of Interpreting Customers' Bills—O. J. Kaufman.

Numbering and Inventorying Office Equipment—Robert Frizelle.

SALES AND ADVERTISING SECTION

W. M. Jacobs, General Chairman

THURSDAY, MARCH 19

9:30 A. M. in Auditorium

Opening Remarks—H. M. Crawford, President, Pacific Coast Gas Association.

Announcements—W. M. Jacobs, Chairman, Sales and Advertising Section.

Sales and Accounting Aspects of Long Term Financing—An open discussion led by E. J. Strickland, Chairman of Domestic Sales Committee and C. T. Burns, Chairman of Accounting Section Committee on Credit Problems.

Home Service Committee: At 10:00 A. M. members of the Home Service Committee will meet in the Employee Lounge across the hall from the Auditorium.

12:15 P. M.

Luncheon served in Cafeteria adjacent to Auditorium.

2:00 P. M. in Auditorium

Review of Home Service on Pacific Coast—Victoria Warner, Chairman Home Service Committee.

"All in a Day"—A skit written and enacted by members of the Home Service Committee.

Cooking Schools—Are They an Important Advertising Medium?—A discussion led by J. S. Spaulding, Los Angeles Gas and Electric Corp.

Progress on National Advertising—A report—F. M. Raymond, Chairman Advertising Committee.

Gas Exhibit at San Diego Exposition—A report—R. J. Phillips, San Diego Consolidated Gas and Electric Co.

Furnishing Survey Data to Dealers—F. W. Thompson, Los Angeles Gas and Electric Corp.

Gas Hair Dryer Campaign in Southern California—Max Scholter, Special Hair Dryer Representative.

FRIDAY, MARCH 20

9:30 A. M. in Auditorium

Industrial Data Bulletin Program—R. L. Grutzmacher, Chairman Industrial Sales Committee.

New Applications of Gas Burner Equipment—C. A. Blesch, Natural Gas Equipment, Inc.

Market Possibilities for Industrial Air Conditioning—A Discussion led by R. L. Grutzmacher, Chairman Industrial Sales Committee.

Advertising Committee: At 10:00 A. M. members of the Advertising Committee will meet in Room 926.

12:15 P. M.

Luncheon served in Cafeteria adjacent to Auditorium.

2:00 P. M. in Auditorium

Industrial Gas Advertising—A discussion led by R. L. Grutzmacher, Chairman, Industrial Sales Committee.

Utility-Dealer Cooperative Advertising—A discussion led by J. Clark Chamberlain, Gas Appliance Association of San Diego.

Exaggerated and Unethical Advertising—A discussion led by A. C. Joy, Pacific Gas and Electric Co.

Radiant Heaters—Their Load Building and Competitive Value—A discussion led by Clyde H. Potter, Southern Counties Gas Co.

Following New Construction—A discussion led by Paul Kuntz, Los Angeles Gas and Electric Corp.

Group Appliance Selling—A discussion led by J. E. Kern, Southern California Gas Co.

Calendar

March

Industrial Gas Section, A. G. A.—Industrial Gas Sales Conference, Hotel Statler, Detroit, Mich., March 10 and 11.

Pacific Coast Gas Association, Sales and Advertising Section, and Accounting Section—Spring Conferences, Los Angeles Gas and Electric Corp. Auditorium, Los Angeles, Calif., March 19 and 20.

Oklahoma Gas & Electric Utilities Association—Annual Meeting, Oklahoma City, March 23.

Pacific Coast Gas Association, Technical Section—Spring Conference, Los Angeles Gas and Electric Corp. Auditorium, Los Angeles, Calif., March 26 and 27.

April

New Jersey Gas Association—25th Annual Meeting, Berkeley Carteret Hotel, Asbury Park, N. J., April 2.

American Gas Association—Distribution Conference, Hotel Peabody, Memphis, Tenn., April 6 and 7.

Mid-West Gas Association—31st Annual Convention, Minneapolis, Minn., April 13-15.

Missouri Association of Public Utilities—Annual Convention, Jefferson Hotel, St. Louis, Mo., April 29, 30 and May 1.

May

Pennsylvania Gas Association—Annual Meeting, Skytop Lodge, Skytop, N. J., May 5 to 7.

Natural Gas Department, American Gas Association—Annual Spring Meeting, Hotel Baker and Hotel Adolphus, Dallas, Texas, May 5-8.

National Fire Protection Association—Atlantic City, N. J., May 11 to 14.

Indiana Gas Association—Annual Convention, Purdue University, West Lafayette, Ind., May 20 and 21.

Industrial Gas Section, American Gas Association—Commercial Gas and Hotel and Restaurant Sales Conference, The Mayflower, Washington, D. C., May 25 and 26.

American Gas Association—Production and Chemical Conference, New York, N. Y., May 25 to 27.

June

American Society of Mechanical Engineers—Dallas, Texas, June 17 to 20.

American Society for Testing Materials—Atlantic City, N. J., June 29 to July 3.

July

American Home Economics Association—Olympic Hotel, Seattle, Wash., July 6 to 9.

Canadian Gas Association Annual Meeting, and *Pacific Coast Gas Association*, Northwest Conference, Hotel Vancouver, Vancouver, B. C., July 8-10.

October

American Gas Association—18th Annual Convention, Atlantic City, N. J., week of October 26.

November

American Petroleum Institute—Annual Convention, Chicago, Ill., November 9-12.

TECHNICAL SECTION

P. E. Beckman, General Chairman

THURSDAY, MARCH 26

9:30 A. M. in Auditorium

Report of Transmission Committee

A. B. Allyne, Southern Counties Gas Co., Chairman.

Calorimetry Sub-Committee:

Progress Report—Guy Corfield, Los Angeles Gas and Electric Corp., Chairman.

Pipe Protection Sub-Committee:

Progress Report—C. P. de Jonge, San Diego Consolidated Gas and Electric Co., Chairman.

Improvements in Electrical Pipe Protection Equipment—W. R. Schneider, Pacific Gas and Electric Co.

Tests to Determine the Importance of Dissimilar Metals Corrosion in a Distribution System—F. A. Hough and A. B. Allyne, Southern Counties Gas Co.

Cathodic Protection by the Southern Counties Gas Co.—H. J. Keeling.

Corrosion Mitigation by Southern California Gas Co. (A colored motion picture)—H. G. Laub.

2:00 P. M. in Auditorium

Compressor Plants and Pipelines Sub-Committee:

Progress Report—B. M. Laulhere, Southern California Gas Co., Chairman.

Piston Ring Temperatures—W. K. Dodd, Southern California Gas Co.

An Instrument for Colorimetric Determination of Hydrogen Sulphide in Natural Gas—M. T. Burton, Southern California Gas Co.

Factors Affecting Flow in Gas Transmission Pipelines—J. B. Reddick, Southern California Gas Co.

Orifice Meter Standards Sub-Committee:

Progress Report—E. H. Fisher, Coast Industrial Gas Co., Chairman.

Relation of Super-Expansibility to Specific Gravity of Hydrocarbon Gases—B. G. Williams, Southern California Gas Co.

The Intermediate Pressure Device—G. B. Reece, Southern Counties Gas Co.

3:00 P. M.

Report of Distribution Committee

Otto Goldkamp, San Diego Consolidated Gas and Electric Co., Chairman.

Domestic Regulator and Meter Capacities vs. Co-incident Demand—Norman L. Hoff, Los Angeles Gas and Electric Corp.

Effect of Humidity of Gas on Leakage Through Jute Caulked Pipe Joints—Peter de Jonge, San Diego Consolidated Gas and Electric Co.

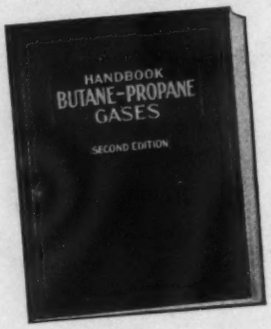
Effect of Varying Humidity in the Distribution System on Domestic Gas Meter Accuracy—C. W. Capwell, San Diego Consolidated Gas and Electric Co.

6:00 P. M.—L. A. G. and E. Cafeteria

Joint Dinner Meeting with Southern California Meter Association

Discussion of Use of New Orifice Meter Coefficients by Northern California Companies. Led by P. E. Beckman, E. H. Fisher, and L. F. Reetz of the Pacific Gas and Electric Co.

THE ONLY HANDBOOK OF BUTANE–PROPANE GASES



Big Second Edition Now Available

CONTENTS: Summary of Two Years' Developments: Use in Internal Combustion Engines: Design and Installation of Storage: Supply from Petroleum Refineries: Engineering Data on the Lower Olefins: Domestic Appliance Testing and Utilization: Economic Comparisons with Coal, Oil, Electricity, Producer Gas, Manufactured Gas: Town Plants: Manufacture from Natural Gas: Special Uses: Volume Correction Factors: Supplements and Revisions: Transportation: Use with Other Gases: Analysis and Testing: Properties of Mixtures: Bottled Gas Distribution: Bibliography: Central Plant Directory: Catalogue Section:

$5.00—Send Check or Money Order To

WESTERN GAS, *Publishers*

809 South Main St.

Los Angeles, California

Write for circular describing contents in detail.

FRIDAY, MARCH 27

9:30 A. M. in Auditorium

Distribution Committee Report (Continued)

Pressure Telemetering and Remote Control—Wm. A. LaViolette, Pacific Gas and Electric Co.

Sub-committee Progress Reports:

Breaking in Gas Meters—Henry Harris, Los Angeles Gas and Electric Corp., Chairman.

Maintenance of Mains and Services—W. F. Pape, Pacific Gas and Electric Co., Chairman.

Combustible Leak Detectors—M. T. Burton, Southern California Gas Co., Chairman.

Gas Meter Change Period—F. S. Honberger, Southern California Gas Co., Chairman.

Unaccounted-for-Gas—F. A. Hough, Southern Counties Gas Co.

Universal Pilot Lights—C. Eldon White and C. W. Stewart, San Diego Consolidated Gas and Electric Co.

12:15 P. M.

Luncheon Served in Cafeteria Adjacent to Auditorium.

2:00 P. M. in Auditorium

Report of Utilization Committee

Guy Corfield, Los Angeles Gas and Electric Corp., Chairman.

Thermostats for Gas Space Heaters—T. G. Wallace, Los Angeles Gas and Electric Corp., Chairman.

Gas Refrigerator Operating Experiences—C. A. Renz, H. V. Buffington, S. E. Vickers, Los Angeles Gas and Electric Corp.

Gas Lighting:

Progress Report: C. A. Thorp, Los An-Angeles Gas and Electric Corp., Chairman.

What Does Present Day Gas Lighting Have to Offer?—W. G. Cox, Los Angeles Gas and Electric Corp.

Distribution Training for Customers' Service—Lee Holtz, Southern California Gas Co.

Symposium on Customer Service—Led by Guy Corfield, Chairman Utilization Committee.

Western Gas Co. 45-Mile Line Is Completed

The Western Gas Co. 6-inch 45-mile natural gas pipe line, construction of which was reported in the December issue of *Western Gas,* to a smelter at Superior, Ariz., has been completed and gas service to the smelter began on February 1. The line takes off from the company's main 10¾-inch transmission line near Casa Grande, and for the first 17 miles of its course traverses an irrigated district, then follows U. S. Highway 180 over the mountains into Superior.

Corriere Made Merchandising Assistant

Appointment of Paul Corriere as assistant to the superintendent of merchandising of the San Diego (Calif.) Consolidated Gas and Electric Co. has been announced by A. E. Holloway, vice-president in charge of sales. In his new capacity Mr. Corriere will take care of merchandise ordering and will supervise the transfer of merchandise. Mr. Corriere has been with San Diego Consolidated for the past ten years, and since 1929 has been appliance salesman at Coronado.

Gas Appliance Dealers:

Only a few weeks more and F. H. A. terms will be a thing of the past. Let's make the coming month the biggest in our history. Use all the "old reliable methods such as newspaper advertising, posters, floor and window displays, direct-mail, etc.—then work up some new and original idea. For example: One enterprising dealer in our territory has a sidewalk-entrance display, plastered with such attention getting cards as those shown above. He's not letting any passer-by forget that F. H. A. appliance-loans will no longer be available after March 31. You,

for

No down payment
Monthly payments as low as $3.00
Up to 36 months to pay . . . . . .

too, can do something that will attract people to **your** store and induce them to **buy now.** Get busy! Cash in on all the F.H.A. publicity that has gone before and tie up with the "farewell" drive that's going on right now.

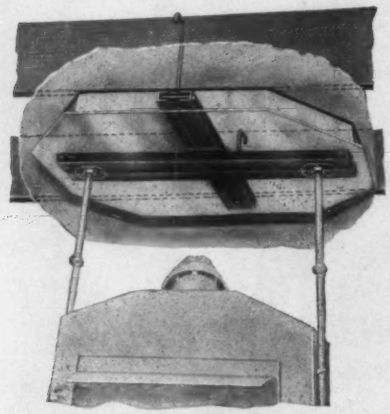
P·G·and E·

PACIFIC GAS AND ELECTRIC COMPANY

Owned, Operated and Managed by Californians

WG 203-336

REDUCE Installation Costs
STOP Vibration
with this Unit Heater
HANGER and CANOPY

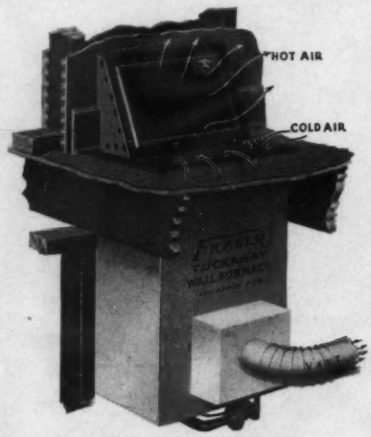


Here is a sturdy, well designed hanger for suspending all sizes of gas unit heaters from ceilings or roof joists. For installations where desirable to conceal hangers an aluminized 24-gauge steel canopy is provided. This feature gives a finished appearance to entire job. Two live rubber cushions absorb vibration and eliminate all noise. Write for new folder giving complete information and illustrating full line of Inland Gas Specialties.

INLAND
GAS SPECIALTIES

INLAND MANUFACTURING COMPANY
(Dept. 2.) 1120 North Cicero Ave., Chicago, Illinois

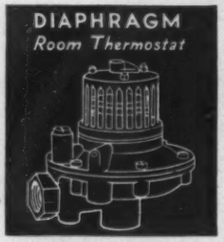
FRASER
TUCK-A-WAY



An entirely new idea in
Furnace Construction
Made in 4 sizes

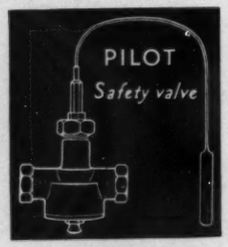
Manufactured by
Fraser Furnace Company
Stockton, Calif.
Distributed by
H. R. Basford Company
San Francisco Los Angeles

BUILD YOUR HOUSEHEATING LOAD
WITH KLIXON CONTROLS



These two advanced Klixon devices give exact automatic temperature control and assure positive pilot protection for your gas-fired space heaters . . . provide sales features that make it easy to sell gas heating.

Write today for descriptive bulletins.



SPENCER THERMOSTAT COMPANY
Unit of Metals & Controls Corporation
34 FOREST STREET • ATTLEBORO, MASSACHUSETTS

PEERLESS GAS HOT PLATES AND LAUNDRIES
Like Peerless Gas Heaters

Have a national reputation for long and satisfactory service—Complete line including one, two and three burner—High and low leg.

Write for Literature
PEERLESS MANUFACTURING CORP.
LOUISVILLE, KENTUCKY

Bargain Gas Rates

(Continued from Page 19)

Now, to get from the present standard rate to the new low cost rate, we charge 8c per hundred cubic feet for each hundred cubic feet used over and above that used during the base month—until the low cost rate is reached.

Under the plan, then, the customer remains on the old standard rate unless his use of service is greater than it was during the base month which in our case, is the corresponding month of the year ended June 30, 1935. We chose this base period because it coincided with the base year of our electric plan and thus results in less cost of administration and less confusion in billing. Whenever the customer's use of service is greater than it was during the base month, such additional use is billed at 8c per hundred cubic feet—the only limitation being that the total bill for service shall be not less than if the entire consumption were billed on the objective rate.

Automatically, any customer getting a bill for an amount equal to the charge for 10,000 cu. ft. on the low cost rate is billed on that rate subject to that bill as a minimum. In addition to this, any customer who uses gas for self-action water heating (or house heating) is billed on this low cost rate. In this latter respect, our gas plan has advantages that the electric does not have. By installing a self-action water heater, the customer immediately qualifies under the low cost rate. In another respect, the gas rates have an advantage over the electric rates. Whereas under the electric plan a customer is able to buy a limited amount of 2c energy instead of paying 2½ or 3 cents for it, the margin is much greater under the gas plan where an 80-cent rate replaces one on the order of $1.40 per thousand and the limit of additional use at the bargain rate is greater.

Of course, there are objections to the plan. The greatest, perhaps, is that due to the element of discrimination. Under the plan, it is possible for a small user of service to build up his use, under low rates, and temporarily be paying substantially less, for a like amount of service, than some other customer who was a good user at the time the plan was adopted. The only answer to this is that the good user of service has not been damaged, since his charges for service have not been increased. Also, his only hope of ultimately decreased rates is that the company's sales may be increased sufficiently to justify direct rate reductions to all customers. Further, it is a fact that the small user can or will increase his use only under rates lower than standard. Therefore, under the plan, no one is harmed and all have an opportunity to benefit in the end. While there is discrimination it is only temporary and is, as some commissions have said, not *unjust* discrimination. The very objection to the plan is its virtue, because it does offer to any customer—even the smaller ones—an opportunity to use additional service at a reduced rate.

No doubt the plan, as outlined, will suggest the possibilities under it and the extent to which we hope to go in not only retaining

our existing business, but also in acquiring new business. In some ways, the plan is more desirable than an out-and-out rate reduction under which a promotional type rate is adopted. If a rate reduction were such that a small user of service could buy additional service at a nominally low rate, the revenue loss would be so great that the company could not stand it. A direct rate reduction of such size as to not injure the company's financial position would have no promotional value because the rate could not break quickly enough down to the promotional level. But under the low cost plan, the company retains its revenue from present business, and any customer above the convenience-user class can get additional service at a reasonably low rate. True, we might not be able to satisfy the very good user unless he has a self-action water heater, but since most of them do have such heaters, that problem is solved well, even if not completely.

In one community where we compete with municipal electric service, it is particularly gratifying to find that in the first month of operation under the bargain rate plan 50 per cent of the customers were able to make use of the benefits offered. Of this 50 per cent approximately one-half had their entire use of service billed on the low cost rate by virtue of either qualifying under the optional feature of it whereby the rate applies to customers having self-action heaters or by reason of having increased consumption sufficiently to have attained the low cost rate. The other half of the 50 per cent were able to get approximately 15 per cent of their service billed on the cross-over rate of 8 cents per hundred cubic feet. In this same locality there was a marked increase in the sale of both storage and tank water heaters and controls on the latter as compared to the corresponding months of the year 1934.

The rate is now available, but will accomplish nothing unless accompanied by intensive sales effort and a program of education tending towards the retention of the cooking and water heating load in the home. To accomplish this, our advertising program is arranged to tie in the element of low rates with the economies that can be obtained by home cooking and the comforts that come from the availability of hot water. "Your Gas Rates Are Bargain Rates" features all newspaper advertising. The body of each advertisement gives recipes for home baking and enlarges upon the fact that it costs so little to bake the article mentioned.

Our sales people are continually promoting the use of additional equipment, being able to say honestly that the cost of operation is so much less than we have been able to offer before.

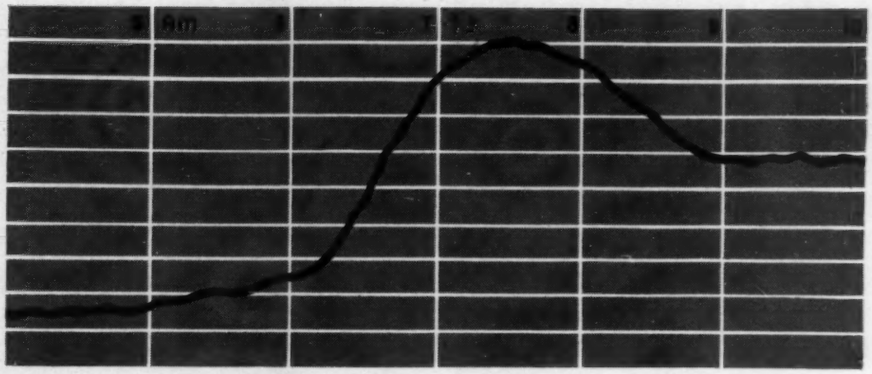
Floyd W. King Passes Away

Floyd W. King, chairman of the board of directors and general counsel of the Virginia Public Service Co., died on January 23. Mr. King was elected vice-president and general counsel of the company when it was created as the result of a merger of several companies in 1926. In 1929 he was elected executive vice-president, locating in Alexandria, the general headquarters of the company, and in 1933 became chairman of the board.

BLAW·KNOX GAS CLEANERS

PROTECT

THAT RISING LOAD CURVE



NO DUST STORMS CAN GET THROUGH TO THE COMPRESSORS

Blaw-Knox Gas Cleaners assure continuous compressor operation as the dust, sand, rust and scale entrained in the gas are entirely removed before the gas reaches the compression units.

These gas cleaners are made in standard sizes to suit most conditions and are specially designed for unusual operation. Write, giving maximum volume and maximum and minimum pressures and we will send you a preliminary estimate of cost.

A small investment in Blaw-Knox Gas Cleaners protects expensive equipment.

BLAW·KNOX COMPANY

2033 FARMERS BANK BUILDING PITTSBURGH, PENNSYLVANIA

AIR CONDITIONING

Electrogas

HEATING EQUIPMENT

FURNACES BLOWERS FILTERS WASHERS

Write for attractive Dealer proposition

ELECTROGAS FURNACE & MANUFACTURING CO.

2575 Bayshore Boulevard, San Francisco

REFRACTORIES

GENERAL CERAMICS COMPANY

· REFRACTORIES ·

For Conversion Burners, Circulating Heaters, etc.

Because they are uniformly accurate, strong, and dependable in every way, General Ceramics Refractories are used by most of the leading manufacturers of gas heating appliances. • Our engineers will gladly cooperate with you.

General Ceramics Company, 30 Rockefeller Plaza, New York

The Goodman Stopper

The Reliable Shut-off for Street Mains

Equipped with Improved Patented Locking Sleeve, which locks both handles to the pipe. Stopper cannot slip. Gas cannot pass.

Safety Gas Main Stopper Co.
523 Atlantic Avenue, Brooklyn, N. Y.

Pac. Coast Rep.: C. B. Babcock Co.
135 Bluxome Street
San Francisco, California

COMBUSTION EQUIPMENT

For every firing and controlling requirement including a full line of the finest conversion burners ranging in price from 7.50 to 150.00.

NEMEC COMBUSTION ENGINEERS, WHITTIER, CALIF.
San Francisco, 780 Bryant St. Phoenix, 530 W. Adams

MUELLER GAS DISTRIBUTION EQUIPMENT

The time-tested Mueller line includes Mueller Evenflow Service Regulators, Gas Stops, Service Stops, Stove Stops, Drilling and Tapping Machines, service boxes, meter trims and similar equipment. Write for description and prices.

MUELLER CO., Los Angeles, Calif.

Factories: Decatur, Ill.; Chattanooga, Tenn.; Los Angeles, Calif.; Sarnia, Ont.
Branches: New York and San Francisco

Kansas City Gas Co. Cooperates With Building Firm

KANSAS CITY (Mo.) Gas Co. is cooperating with the J. C. Nichols Co., Kansas City building firm, in furnishing gas equipment for all-gas homes which were constructed recently and opened for inspection by the building company. The homes are equipped with automatic gas range, automatic water heater and automatic heating.

The furnace and water heater are purchased by the building company for each home and the range is supplied by the Kansas City Gas Co. When the home is sold, the gas company endeavors to sell the range to the new owner. During the inspection period the homes are heated with the gas furnace.

In a Sunday newspaper during January the Kansas City Gas Co. ran a full page advertisement which carried photographs and descriptions of four Nichols homes and invited the public to visit them. The advantages of the all-gas home were pointed out in the advertisement, and the facts stressed that 116,447 Kansas City homes use gas for cooking and 65,272 for water heating. Kansas City Gas Co. plans to run similar advertisements on the homes in the future, emphasizing the modernity of gas as the fuel for all domestic purposes.

Advertising Bonus Boosts Heater Sales in San Diego

ADVERTISING allowances offered dealers on sale of space heaters resulted in stimulating considerable new load from these appliances for San Diego Consolidated Gas and Electric Co. in a campaign conducted last fall. The offer was open to all members of the Gas Appliance Society of San Diego County.

On each unvented heater sale 50 cents was allowed, and 75 cents on each sale of a vented heater, to go toward space heater advertising. Each dealer received a supply of "OK Approval Tags" from the company, which were filled out with name of buyer and other information, and returned to the company, together with proof of publication of advertising. This program brought a number of dealers into advertising gas heat for the first time and considerably increased the volume of fall advertising. It also resulted in reducing the amount of advertising done on oil heaters.

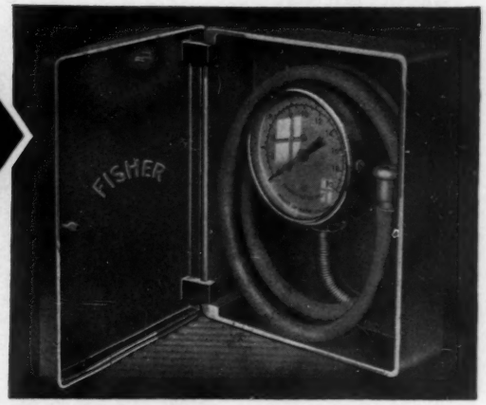
Approximately 1,700 heaters were sold during the fall campaign, and the company paid out about $1,000 on the advertising bonus offer.

Consumers Power Co. Extending Natural Gas Service Area

Consumers Power Co. has been granted a certificate of convenience and necessity to supply natural gas to Alma, St. Louis, Ithaca and Breckenridge in Michigan, which towns it now supplies with manufactured gas.

The Public Utility Commission of Michigan has taken under consideration a request of the Consumers Power Co. for permission to tap the line, which it is constructing from the gas fields in Montcalm and Mecosta counties to Lansing, with a line to serve St. Johns, Owosso, Shepherdsville, Vernon, Corunna and Durand.

Another Advancement IN THE GAS INDUSTRY BY FISHER



Inches of Water Column Direct Reading Test Gauge

Fisher Governor Company scores again by introducing the first practical and absolutely dependable low pressure test gauge. Designed and developed especially for the gas industry. Direct reading, double calibration, 0 to 35 inches of water column and 0 to 20 ounces. Black markings on silver dial permits easy and accurate reading.

Figure No. 50 Gauge is available with test case and hose (above) or ¼" bottom connection as shown below.

Sturdy . . . Accurate . . . Low Cost

The bronze diaphragm and non-friction movement mechanism is of the unit or independent type, that is, independent of the case in which it is mounted. This gauge is more sturdy than a Bourdon tube type and will retain its calibration within close limits. Available as a regular test gauge 2½" diameter black steel case, nickle ring, convex non-breakable dial and ¼" bottom connection, or the same gauge mounted in cast aluminum carrying case complete with flexible connection hose. Stop the costly use of water columns or manometers. Speed up your testing operators. Give them the finest and latest equipment. Equipment that will pay for itself in a short time. You'll be surprised at the low initial cost. Write for bulletin No. 8.

Fisher Governor Company

201 SOUTH FIRST AVENUE
MARSHALLTOWN, IOWA

FISHER TRADE MARK

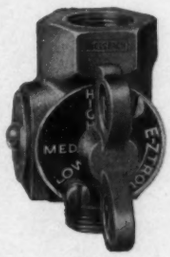
REPRESENTATIVES IN EVERY PRINCIPAL CITY

PICK A LEADER

WIN ANY CONTEST WITH

HOTZONE GAS WATER HEATERS

HIGHLY EFFICIENT
MINIMUM SERVICE REQUIRED
LUMINOUS FLAME BURNER
100% SAFETY GAS SHUT-OFF
SILENT IN OPERATION



E-Z TROL

ENABLES CUSTOMER TO CONTROL HIS GAS BILL FOR HOT WATER

LOW: For moderate hot water demand.

MED: For normal hot water demand.

HIGH: For exceptional hot water demand.

Hotzone

WRITE FOR CATALOG

Welsbach COMPANY

Gloucester, N. J.

BRANCHES IN CHICAGO AND SAN FRANCISCO

Since 1887, Pioneers in the Manufacture of Gas Burning Appliances.

CONNELLY REGULATORS *for* **APPLIANCES**

Regulators for Pilots, Refrigerators, Ranges and All Appliances.

The Connelly Jr. (upper left) is made in ¼" Size only—Compact, simple and sensitive for small capacities.

Connelly Type DCS—Spring Loaded; and Type DCW—Weight Loaded—are designed for long service with a minimum of maintenance. They are rugged, simple and direct acting; occupy small space and give accurate control.

\+ + +

CALOROPTIC BTU INDICATOR
BACK PRESSURE VALVES
U-GAUGES—H_2S TESTERS

\+ + +

Connelly Iron Sponge & Governor Company
Chicago, Ill. 3154 South California Ave.
Elizabeth, N. J. 200 South Second Ave.
N. E. Agent—Theo H. Piser, Waban, Mass.

Enlarged Gas Exhibit at San Diego Exposition

A MUCH enlarged gas industry exhibit is already open for early-comers to the new California Pacific International Exposition, which reopened at San Diego last month and will extend until September 9.

Ralph Phillips, engineer of gas sales for the San Diego Consolidated Gas and Electric Co., has been in active charge of arrangements for the gas section, which now occupies about one-third of the Better Housing Building.

Featured at the exhibit this year is a little theatre at which a gas industry sound film will be shown. Clifford Hansen of the San Diego company designed the theatre, which was erected under Mr. Phillip's supervision.

The industry film, entitled "20 Million Years," was prepared cooperatively by gas companies of Southern California and takes natural gas from its origin through its many forms of service to home and industry. There will be hourly showings of this film, supplemented with travel pictures and other short subject films of entertainment nature.

The theatre was finished and gave its first showing on the evening of February 21. It seats 90 people, and has an usher and operator in constant attendance.

San Diego Consolidated Gas and Electric Co. and Southern Counties Gas Co. are occupying the same space with their joint exhibit which they filled last year, featuring modern gas appliances and a model kitchen. One side of the exhibit is given over to an A.G.A. Testing Laboratory display.

In addition to the general exhibit of the gas companies, and the little theatre, four other main exhibits occupy the central block of the gas display, which in all covers nearly 5,000 feet of floor space. Payne Furnace and Supply Co. sponsors one of these, exhibiting several models of basement furnaces, F.A.U. units, and console heaters. Day and Night Water Heater Co. also has a section of this exhibit space. Another main unit is that of Electrolux, where all sizes of modern gas refrigerators are seen in attractive settings. National Heating and Engineering Co. has another space, exhibiting the Marvelaire line of heating and air conditioning equipment. A fourth major space is occupied by the Pacific Gas Radiator Co. in which are shown numerous models of the company's varied line of heating equipment.

Across the aisle from the gas company section of the display is a large space shared by six gas range manufacturers, American Stove Co., James Graham Manufacturing Co., Gaffers & Sattler, O'Keefe & Merritt Co., Geo. D. Roper Corp., and Tappan Stove Co. The stove exhibit is now being completed, occupying another 1,000 feet of floor space.

Gas exhibits at the new exposition cover about four times the space they filled last year. Two full-time attendants will be in charge, one at the gas company display and one at the range section, in addition to those handling the little theatre.

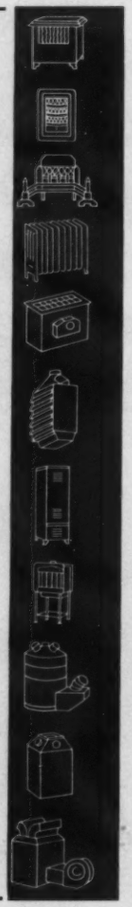
PGR

PACIFIC
Gas Heating Appliances

- Circulator Heaters
- Radiant Wall Heaters
- Gas Steam Radiators
- Floor Furnaces
- Gravity Furnaces
- Blower Furnaces
- Unit Heaters
- Forced Air Units
- Water Heaters

Write for Catalog No. WG-3

PACIFIC GAS RADIATOR CO.
Huntington Park, Calif., U.S.A.



Home Building Promotion Activity by Northern Illinois Company

Under the theme "1936 Is the Time to Build," the Public Service Co. of Northern Illinois has launched an advertising campaign designed to boost home construction in the communities which it serves.

A building service has been established in connection with the campaign to provide suitable facts about construction to those contemplating the erection of homes.

Newspapers, bill boards, window displays, talks before civic organizations, and radio programs are being brought into service in the campaign, according to J. R. Pershall, advertising manager of the company.

MacLeod Gets London, Ont., Appointment

John G. MacLeod, formerly with the United Gas and Fuel Co. of Hamilton, Ltd., Hamilton, Ontario, has been appointed office manager of the City Gas Co. of London, Ontario, an affiliated organization. Mr. MacLeod has been connected with the United Gas and Fuel Co. since 1929.

Utilities Power & Light Co. Executives Re-elected

Harley L. Clarke was re-elected president of the Utilities Power & Light Co. at a meeting of the board of directors of the company held on February 5. Other officers re-elected were J. N. Canavan, vice-president in charge of engineering; H. T. Pritchard, vice-president in charge of operation; W. A. Horner, vice-president and secretary; Ben E. Tate, vice-president; Neill Richards and Ira E. Guthrie, assistant treasurers. D. M. Workman is gas engineer of the company, and A. H. Davis purchasing agent.

Kelvinator Corp. Enters Gas Range Field with Six Models

THE Kelvinator Corp., Detroit, Mich., has entered the gas range manufacturing field with the presentation of six models of gas ranges. Among the features of Kelvinator's new line are multiple-wall oven construction, removable oven bottom, Robertshaw heat regulator, independent oven safety gas cock, four cooking top burners in heat-concentrating wells, spring-hinged top cover and recipe card file. Accessories such as automatic oven time control are available if desired with three of the models.

The six models cover a wide range of sizes and price classifications. One of the larger models has a lever at the side for moving oven racks in and out; another has a griddle and two of the cooking top burners are of the double-duty type, with simmering bars that operate from the regular burner cock; this latter model also has a utensil compartment with a plate-warming burner.

Hardgrave and Lynn Get Promotions

Promotion of G. H. Hardgrave and J. M. Lynn to sales supervisor and to chief clerk of the sales department of the Dallas (Texas) Gas Co., respectively, was announced recently by C. K. Patton, new business manager. Mr. Hardgrave was formerly on a special house heating assignment and Mr. Lynn was sales supervisor.

MODERN METHODS AND MATERIALS

A letter to WESTERN GAS will bring you any of the selected reference bulletins listed below, without cost. Indicate by number which you desire.

NO. 109—GAS BURNERS
Folder illustrated with photographs of a complete line of gas burners. Covers line of specialty torches operating on any type of gas, and auxiliary equipment and tanks for use with liquefied gases.

NO. 110—GAS COOLERS
Brochure describing steam-jet refrigeration equipment for condensing out objectionable vapors from gas.

NO. 111—AUTOMATIC CONTROLS
Twenty-four-page catalogue listing a line of automatic controls for gas heating, air conditioning, refrigeration and industrial applications. Contains photographs of units and gives their adjustment and capacity ranges.

NO. 112—HEAT TREATING OVENS
Illustrated bulletin on gas-fired convection ovens for industrial processes. Contains tables for sizing and specifications under two temperature ranges.

NO. 113—ELECTRIC WELDING
Pamphlet listing electric welding equipment, containing tables and specifications for electrodes, welding machines, auxiliary equipment and electric welding operations.

NO. 114—AIR CONDITIONING
Three-color booklet covering a line of year 'round, automatic, domestic air conditioning equipment.

NO. 115—STORAGE TANKS
Twenty-four-page bulletin on steel tanks for oil and gas storage and tank accessories. Covers tank design, general specifications for storage tanks, riveted joint efficiency tables, circumferences, area and volume tables, capacity charts, conversion factor tables, gravity tables, vapor pressure chart and a list of miscellaneous formulae for tank calculations.

NO. 116—COMPRESSORS
Bulletin on heavy duty compressors with cut-away illustrations showing construction and operation of component parts; also photographs of complete assemblies. Describes indicating type regulators and auxiliary devices.

NO. 117—TESTING APPARATUS
Eighty-page catalogue on apparatus for testing petroleum products and bituminous materials. Also general utility apparatus for testing burners, heaters, etc. Contains detailed specifications and references to governing standards, A. S. T. M. reference index, etc.

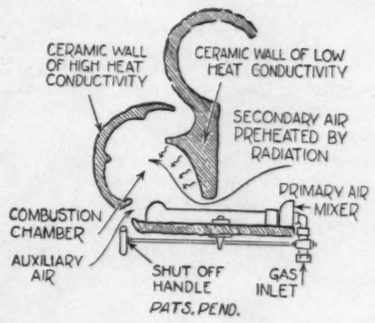
NO. 118—COMBUSTION CONTROL
Air-operated combustion control system for automatically regulating steam pressure, combustion efficiency and furnace draft, described in a 31-page bulletin illustrated with photographs and drawings.

at last! . . . . the solution to your fireplace heater load problem . . . .

GLO-FIRE©

Odorless Gas Logs

A.G.A. APPROVED



Odorless
because GLO-FIRE gas logs embody a revolutionary principle in gas heater design. They open up the vast, untouched fireplace heater market that has heretofore been closed to gas, because never before has there been a proven odorless gas log.

Natural Appearance
of oak logs is so closely simulated that only by touch can the difference be detected. The trend of modern architecture is back to the open hearth. GLO-FIRE logs' natural appearance induces lighting for the effect as well as for warmth—prolonging your seasonal heating load.

Unparalleled Efficiency
is attained through the radical departure in gas heater design, illustrated in the cut-away drawing at the left. Combustion takes place in two stages, the first inside the lower log, heating the interior ceramic walls and baffles to incandescence while drawing in a stream of preheated secondary air; the second stage of combustion takes place as this mixture of otherwise wasted by-products of combustion and preheated secondary air impinges on the glowing, incandescent surfaces of the logs, utilizing to the last particle every B.t.u. of input, thus assuring perfect, odorless operation.

Write today for details

The GLO-FIRE Odorless Gas Log is a circulating unvented gas heater, available in two sizes—24-inch logs with rated input of 28,000 B.t.u., and 20-inch logs with rated input of 17,500 B.t.u.

Exclusive Distributors

COLONIAL SHOPS

Distinctive Fireplace Fixtures

3350 W. First Street Phone FEderal 8852 Los Angeles, Calif.

MODERNIZE
YOUR POWER PLANT

Modernizing present power equipment with the ENSIGN COMBINATION **Gas and Gasoline** CARBURETOR will pay dividends in higher efficiencies, improved performance, and important earnings in fuel and over-all power costs. This perfected device combines the scientifically engineered carburetion of both gas and gasoline fuels in one compact unit that is adapted to all types of multiple cylinder stationary, tractor, and farm equipment motors. Change from gas to gasoline fuel can be made while engine is operating. Extremely simple, and once properly installed requires practically no further attention. Easy starting; efficient; economical; dependable. Backed by fifteen years of successful operation on engines of many types. Write for bulletin and name of nearest dealer.

Ensign Carburetor Company, Ltd.
7010 S. Alameda St. P. O. Box 606
Huntington Park, California

ENSIGN
Combination
Gas and Gasoline
CARBURETOR

Ensign Carburetor Co., Ltd., 450 E. Ohio St., Chicago, Ill. Mid-Continent Distribution and Service Facilities Maintained By: A. W. Schuller, Inc., 114-116 E. 9th St., Tulsa, Okla.; The Binkley Co., Oklahoma City, Okla.; Portable Rig Co., Houston, Dallas and Longview, Texas.

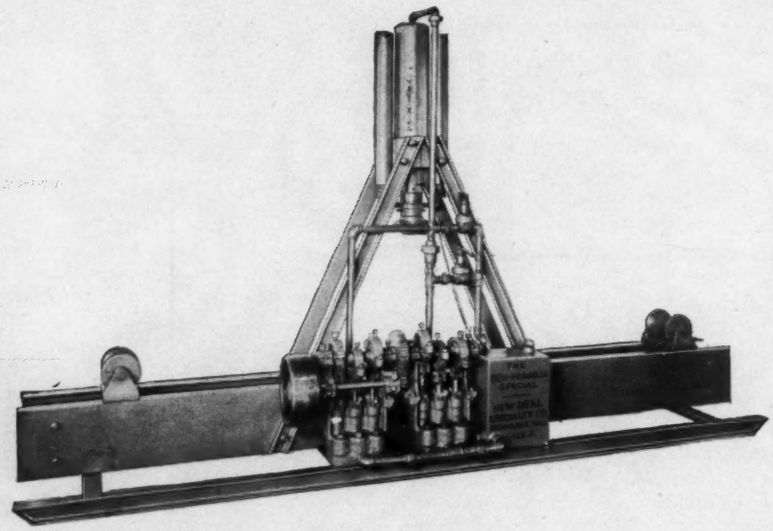
The NO-OX-ID Master Coat adds years to the life of gas lines, reduces future maintenance costs and does credit to the names of the engineers who choose it. Investigate the NO-OX-ID Master Coat. It is in use in all sections under every type of soil and climatic condition. Data and recommendations furnished gladly.

DEARBORN CHEMICAL COMPANY
Los Angeles: 807 Mateo Street, Phone TRinity 3385
San Francisco: 421 Bryant St., Phone SUtter 8688

buy *this* gas range because it has Robertshaw oven-heat-control!" That, in effect, is what this lively little figure shouts when you hang him on your Robertshaw-equipped gas ranges. He ties right up with Robertshaw national advertising—running now.

He'll help you sell. He's a price tag, too. Write for a quantity.

ROBERTSHAW
THERMOSTAT COMPANY
YOUNGWOOD, PA.



New Model High-Speed, High-Pressure Pipe Straightener

THE New Deal Specialty Co., Okmulgee, Okla., has put into production its new Duo-Hydraulic Pipe Straightener, Model D "Ben-Franklin Special," illustrated below, which is equipped with both high speed and high pressure Triplex pumps of the company's own manufacture.

The Model D pipe straightener unit measures 12 feet long, 7½ feet high and 3 feet wide. Regular models are mounted on a steel sled for convenient moving and the base is heavy 12-inch channel, spaced so that steel slides on the carrying wheels can be moved to any position. The carrying wheels are designed to fit the pipe and three steel shoes are provided for different sizes of pipe to prevent kinking.

Steel castings are used for strength and the hydraulic cylinder is made of heavy seamless tube, bored and ground to a smooth finish. Ample oil storage is provided and all parts are readily accessible for adjustment and replacement.

The "Ben-Franklin Special," which is the company's fastest model, handles either light or heavy weight pipe, and can normally take 36-pound seamless pipe up to 8⅝ inches outside diameter, and a special attachment is available for 10-inch pipe. The unit is powered with two Triplex pumps, one for high speed and the other for high pressure and has a 24-inch ram stroke.

Oklahoma Natural Appliance Sales Total 37,988 in 1935

IN the territory served by Oklahoma Natural Gas Co., which headquarters at Tulsa, a total of 37,988 gas appliances were sold during the 12 months of 1935, representing $2,241,701 in retail sales value in a field of 124,904 residential and commercial accounts, and $18.07 per consumer. These figures for 1934 were respectively 26,884, $1,524,646 and $12.61.

The total number of appliances sold in 1935 includes 395 gas furnaces and boilers, 330 conversion burners, 13,697 open space heaters, 2,013 floor furnaces, 2,149 circulating heaters, 11,238 gas ranges, 2,891 automatic water heaters, 2,204 manual water heaters and 1,911 Electrolux refrigerators.

Total gas sales for 1935 showed an increase of 6.7 per cent over the year previous. Average gas sales per domestic customer were 93.8 M c.f., a gain of 5.5 M c.f. over 1934.

Peerless Representative Visits Coast

R. W. Springer, sales representative for the Peerless Manufacturing Corp., Louisville, Ky., made a tour of the Pacific Coast during February. Mr. Springer covered Arizona, California, Oregon and Washington.

Safe Driving Record Men of Ohio Companies Rewarded

Sixty-seven drivers of the Toledo branch of the Northwestern Ohio Natural Gas Co. and the Ohio Fuel Gas Co., who have driven an aggregate of 176 years without an accident, received high praise and safety awards last month as an activity of the campaign for safe driving inaugurated by the companies four years ago.

Twenty-six drivers had perfect four-year records; five had driven three years with no accidents; 21 men had two-year records without a bad mark; 15 had perfect one-year scores. Certificates showing the length of term of safe driving were presented to each driver. In addition, each four-year man was presented with a clock and three-year drivers received driving goggles with special lenses and frames.

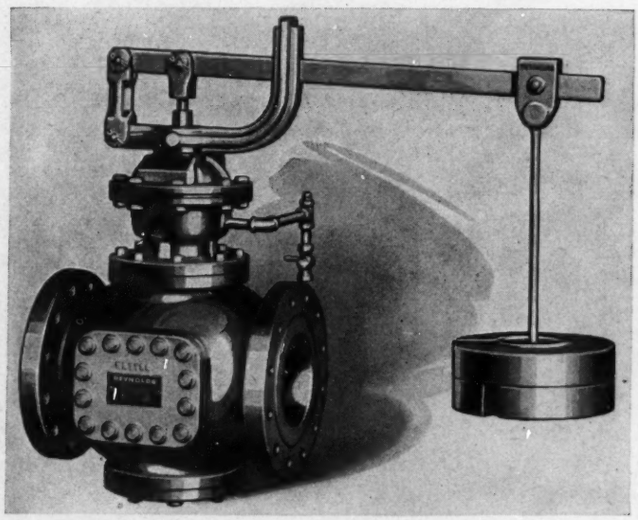
Barber Burner Distributors in So. Calif.

Harry E. Kerr, president of the Barber Gas Burner Co., of Cleveland, Ohio, while on the west coast last month appointed Talbot & Clark of 912 East Third St., Los Angeles, as Southern California distributor for his company. Mr. Kerr is making a four-month trip covering the South, Mid-Continent, Mid-West and Pacific Coast sections of the industry, and reports heavy increases in his organization's sales.

REYNOLDS
GAS REGULATORS
for every purpose!

As long as there is a need for gas control regulation, just that long will the name, REYNOLDS, be symbolic of dependable, accurate, gas control.

REYNOLDS Gas Regulator Company's more than forty years of leadership is proved by the hundreds of thousands of Reynolds Regulators that still give satisfactory performance after years of service.



REYNOLDS New High Pressure Line Regulator, without auxiliary bowl, features a wider range of delivery pressure control, (21 lbs. to 100 lbs.). In addition, Reynolds build High Pressure Line Regulators with auxiliary bowl where complete lock up is required. Write for details.

Reynolds Branch Offices:

421 Dwight Building
Kansas City, Missouri

2nd Unit, Santa Fe Building
Dallas, Texas

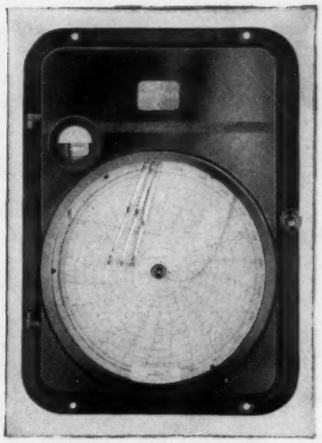
Representatives:

Eastern Appliance Co.,
Boston, Massachusetts

F. E. Newberry
Avon, New Jersey

REYNOLDS
GAS REGULATOR COMPANY
Anderson, Indiana, U. S. A.

GAS CONTROL SINCE 1892



Meters flow *precisely*
in severe field service

Employing the widely accepted orifice and mercury manometer system of flow measurement, this new Bristol's meets the needs of industry for a rugged, accurate and reasonably-priced mechanical flow meter. Even under severe field conditions it can be counted on to give precision measurement.

Meter body is of forged steel, with stainless steel parts inside mercury chambers. Connections are welded or mechanical. The stuffing box is of hardened stainless steel. Grease-packed, it is absolutely leak-tight.

Check valves, operating by gravity, prevent the loss of mercury. A bushing, inserted in the line between the two chambers, dampens the effects of pulsations. Meters for working pressures of 1,000 lbs. are tested at 2,000 lbs. Special bodies tested at 5,000 lbs. are available for working pressures up to 3,000 lbs. Write for descriptive Bulletin 425.

Illustration above shows Bristol's Flow Meter, Model 1140M.

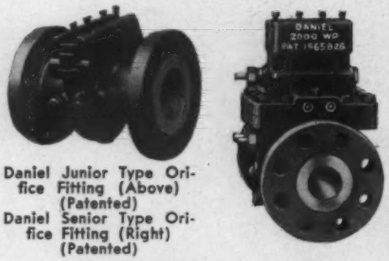
THE BRISTOL COMPANY

Branch Offices: Rialto Bldg., San Francisco . . 747 Warehouse Street, Los Angeles . . Branch Factory: 311 Minna Street, San Francisco

BRISTOL'S

TRADE MARK REG. U. S. PAT. OFF.

PIONEERS IN PROCESS CONTROL SINCE 1889



Daniel Junior Type Orifice Fitting (Above) (Patented)
Daniel Senior Type Orifice Fitting (Right) (Patented)

DANIEL ORIFICE FITTINGS Meet All New A.G.A. Requirements

The Industry's endorsement of DANIEL Orifice Fittings is based upon tested and proved performance under the most severe conditions. Repeat orders, in growing numbers, from satisfied DANIEL users are convincing proof of the fact that it **pays to standardize** on DANIEL Orifice Fittings. Write for prices, specifications and technical data.

DANIEL ORIFICE FITTING COMPANY
2719 Elm St. Phone CA 9228 Los Angeles, Calif.

1936 is the BIG YEAR

Conservative Babson and Brookmire Forecasts predict that 1936 will be a year of progress. Higher prices, business expansion, new residential building. Your opportunity to make more money by selling the best floor furnace money can buy. Sell WARDS! WARD with its three exclusive features . . . Bilt-in Thermo-Control . . . Cradle Circulation . . .Automatic Pilot . . . can give your customers the maximum advantages in "controlled winter comfort." More than 300,000 WARDS in use today. When you sell a WARD you sell a life-time of dependable service.

Build your load with WARDS

For further load-building information, call, phone, or write . . .

WARD HEATER CO.
1800 W. WASHINGTON
LOS ANGELES, CALIF.

PLANS FOR 1936 House Heating Campaigns

. . . SHOULD INCLUDE gas heating equipment that will build your gas load and create good will among your customers.

The sale of PAYNE products will insure the success of your gas heating campaign and bring absolute customer satisfaction.

PAYNE FURNACE & SUPPLY CO.
BEVERLY HILLS, CALIFORNIA

Western Gas
is compressed by
COOPER-BESSEMERS
50 to 1600 horsepower

THE COOPER-BESSEMER CORPORATION
640 East 61st St. Los Angeles, Calif.
PLANTS: Mt. Vernon, Ohio — Grove City, Pa.

The Exploroscope

(Continued from Page 14)

made very much smaller and simpler in design than the existing one, increasing the efficiency and enlarging the field. This new design would use two prisms, instead of one, for a complete traverse of the pipe circumference. By means of different type lenses, it would be possible to see farther down the pipe with the instrument than with the unaided eye. By the use of longer exposures, photographs could be taken of sections farther down the pipe than can be seen through the apparatus. By having the lamp outside the main, a more powerful light can be utilized and its beam concentrated upon the object under observation.

While there is more to be done in the development of this instrument, the success so far is sufficient encouragement to warrant further effort.

Oklahoma Natural Has Active Home Service Department

AS a function of its Home Service Department, the Oklahoma Natural Gas Co., headquartering at Tulsa, maintains clubrooms and model kitchens in several of its district offices. The 1935 annual report prepared by Mildred R. Clark, home service supervisor, reveals that 38,845 guests used the club rooms during 1,123 meetings held for the year, and 5,109 employees used them during 105 meetings.

Among other activities of the department listed in the report were the preparation of 983 columns on recipe and appliance information for publication in 37 weekly newspapers; 4,500 home service calls; 45 demonstrations conducted on company floors, which contacted 6,900 women; 27 demonstrations in dealers' stores which contacted 3,024 women; 18 special lectures given in the club rooms; and 47 cooking schools with a total attendance of 12,005.

Silver City Grants Franchise For Natural Gas

Southern New Mexico Natural Gas Co. on January 27 was granted a franchise to serve natural gas in Silver City, N. M. The franchise is subject to acceptance by the company within 120 days from the passage with the provision that service must be established by January 1, 1937. The company is making a survey to determine the potential gas load available.

It is understood that the proposed system will be supplied through a pipe line to be constructed from a point 8 miles west of Deming where it will tap the Western Gas Co. carrier.

East Gets Houston Appointment

Charles W. East has been appointed district sales manager of Republic Steel Corp. at Houston, Texas, according to an announcement from N. J. Clarke, Republic vice-president in charge of sales. Mr. East was formerly assistant manager of sales in Republic's pipe division. He succeeds Robert E. Lanier, who has resigned.

Smoke and Odors Eliminated By Gas-Fired Incinerator

SAFEWAY Incinerator Co., Los Angeles, has placed on the market a recently developed gas-fired incinerator which cremates all types of kitchen refuse without producing smoke or odor. The incinerator is constructed of cast iron and is divided into three sections, a receptacle for combustible rubbish, one for garbage and one for burning smoke and odors.

The rubbish compartment is just above the ash collector, and immediately above is the grate into which the garbage is placed and under which burns a long gas flame that engulfs the entire grate. The smoke and unburned gases pass into the third chamber where another gas flame completes the process, burning the smoke and odors.

The incinerator is equipped with an automatic timing device which sets the incinerator into operation and shuts it off at predetermined intervals, both burners being provided with pilots. The appliance has an hourly consumption of 150 cu. ft. per hour. It is available in a backyard outdoor model or can be adapted for installation within the structure of the building and provided with a garbage chute from the kitchen.

Cooperative Association Formed to Promote Montana-Minnesota Pipe Line

A Northwest Natural Gas Cooperative Association has been formed to promote a natural gas transmission line from Montana fields to Minneapolis and St. Paul. The line would also serve a number of communities along its route in the Iron Range. Principal talking point of the Association is that utilization of some two billion dollars of low grade iron ore would be made possible.

The Cooperative Association is incorporated under Minnesota laws, and will have 21 directors selected from the territories the proposed line would serve. To date the following directors have been selected: A. M. Drake and M. E. Williams, Minneapolis; Dr. W. B. Richards, St. Cloud; Frank Traynor, Van Hook, N.D.; and J. C. Dwyer, Wolf Point, Mont.

Philadelphia Company Sued for Over Twelve Million Dollars

The city of Philadelphia has filed suit against the United Gas Improvement Co. and a subsidiary, the Philadelphia Gas Works Co., to recover $12,741,457, which it is alleged was improperly received or disbursed. The suit also asks an injunction restraining the Philadelphia Gas Works Co. from operating the city's gas plant which it has under lease, and the dismissal of the three members of the gas commission. Present lease of the gas plant expires December 31, 1937.

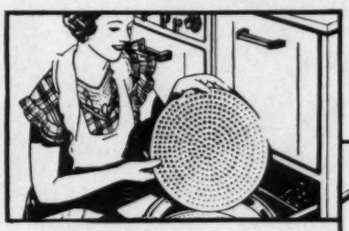
Mercoid Corp. Issues New Catalogue

The Mercoid Corp., Chicago, has issued a "General Abridged Catalog Number 100", which lists the company's line of automatic controls for heating, air conditioning, refrigeration and for industrial applications. The various pieces of equipment are illustrated with photographs accompanied by descriptions that give capacity and adjustment ranges, operating and installing instructions, etc.

THE Style Leader FOR 1936

The Wedgewood MASTERPIECE (Model 1022 BK)

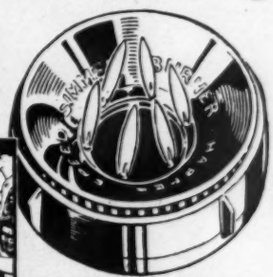
Has features that provide entirely new principles in cooking



ASTOGRIL BROILER

The cast aluminum rotor-grill is preheated to sear on both sides at once to seal in flavors and juices.

Extra work space is furnished by the convenient waist-high oven top.



SPEED-plus-Simmer Aluminum Burners permit semi-waterless cooking with regular utensils.

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Members of the General Committee of the Southwestern Gas Measurement Short Course

Southwestern Measurement Short Course Dates Set

DATES for the Southwestern Gas Measurement Short Course, held annually at the University of Oklahoma in Norman, are announced as April 21, 22 and 23. The course is sponsored by the Oklahoma Gas and Electric Utilities Association, the School of Natural Gas Engineering of the University of Oklahoma and the Corporation Commission of the State of Oklahoma, and is open to all measurement men and to engineering students of the university.

The general committee for the Short Course met at Norman on January 20 to formulate the program and a final meeting of the committee is scheduled for some time this month to complete arrangements. R. D. Turner, of Tulsa, is chairman of the general committee and E. E. Stoval, of Dallas, is chairman of the program committee. Publication of a bulletin covering the proceedings of the Short Course for 1935 and for this year's sessions has been authorized and will be available to those who register and additional bulletins may be secured by others at a nominal charge.

Eliminate the Lubrication of Rods With Accordion Wet Steam Packing

The Accordion Packing Ring has a laminated construction which enables it to hold ANY kind of steam without lubricating the rod.

Each set of wet steam packing is furnished with special outside rings which prevent the escape of excessive moisture, thus making it useful on vertical rods to prevent mulsification of engine crankcase oils.

The rings are also specially made to withstand acids or alkalies in wet steam without softening, and will seal without lubricating the rod.

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Public Interest High in Mystery Chef Broadcast

Public interest in the Mystery Chef radio program and particularly in the 100-page recipe book entitled "Be an Artist at the Gas Range" which is offered free to radio listeners, is growing rapidly as the program approaches its third month on the air. In less than two and a half months of actual broadcasting, nearly 500,000 customers of participating gas companies had called in person for the book at company offices. A second printing of 500,000 copies is now on the presses.

Two additional companies have joined the network program which extends from Washington, D. C., to Portland, Maine, and from New York City to Buffalo. These are the Greenfield (Mass.) Gas Light Co., and the Central Vermont Public Service Corp., Rutland, Vt. Total participants in the present broadcasting area number 99. A number of companies outside this area are interested in taking on electrical transcriptions and it is expected that companies at Richmond, Va., and at Nashville, Knoxville, Chattanooga, and Memphis, Tenn., soon will use transcriptions over their local stations.

Lone Star Underwriters Hall of Religion for Texas Exposition

At the request of the Religious Participation Committee and the Management Committee of the Texas Centennial Exposition, the Lone Star Gas Co. has agreed to build a Hall of Religion as the company's participation in the state's centennial celebration. The building will cost some $50,000 and will be located on the grounds of the Texas Centennial Central Exposition in Dallas, which will open on June 6.

The Hall of Religion will be a permanent structure for religious meetings and will have 11 separate rooms for the exhibits of the various denominations. In addition, it will contain a modern kitchen, a patio and reception and assembly rooms and will be air conditioned. Completion of the building is expected by May 15.

New Water Gas Plant for Cedar Falls

The city of Cedar Falls, Iowa, has awarded a contract to the Semet Solvay Engineering Corp., of New York, for a new water gas plant. The city now serves 550 B. t. u. manufactured gas to about 2,300 customers.

The new equipment will include a gas holder, two Semet-Solvay water gas machines, blowers, a condenser, tar extractor, exhausters, purifiers, tar storage tank, meter, and scales. The water gas machines will be equipped for backrun operation.

Work on this contract will be undertaken at once, the plant to be ready for service in the spring.

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U.S. cast iron PIPE

Cast iron and alloy cast iron pipe centrifugally or pit cast—for water works, gas, sewerage and drainage service as well as industrial uses involving corrosives.

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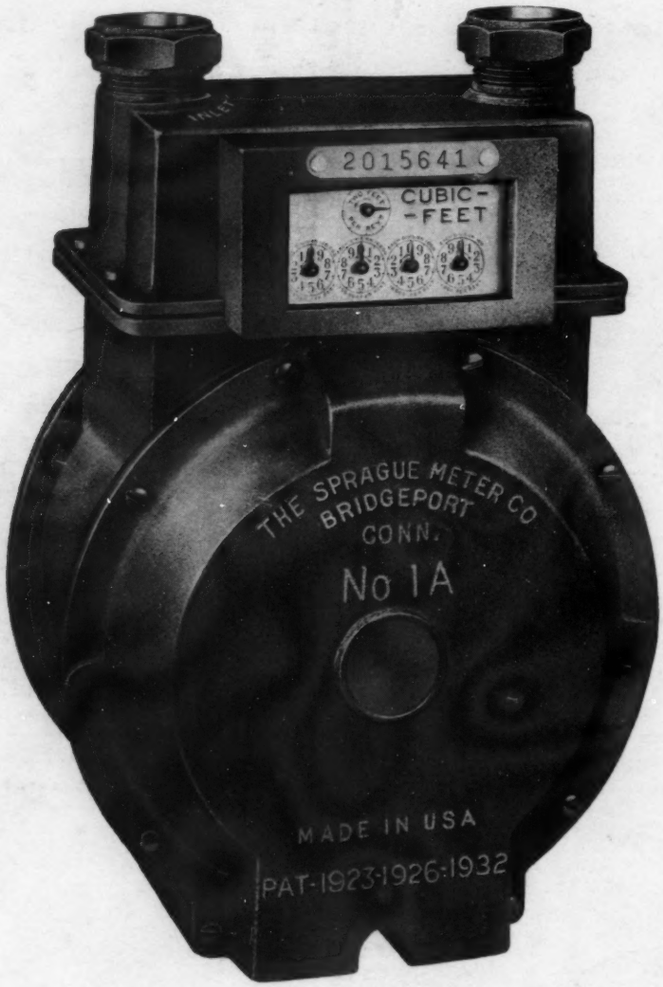

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